#1 Atari Computer Magazine

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# Antic®

The ATARI® Resource

FEBRUARY 1985 VOLUME 3, NUMBER 10

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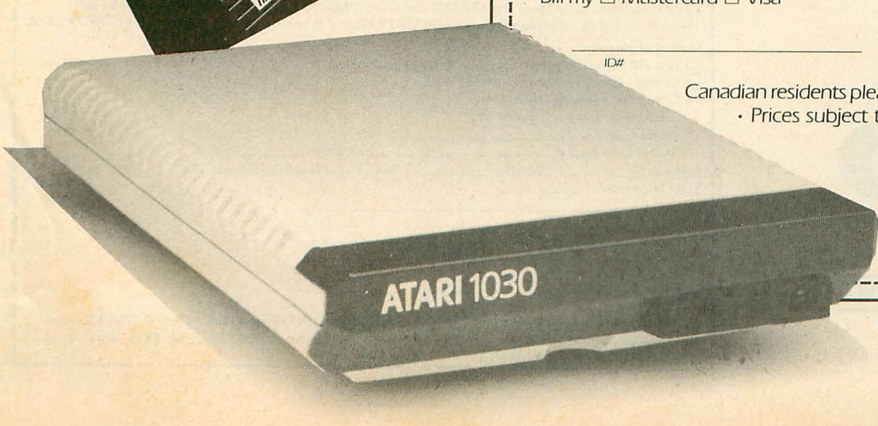
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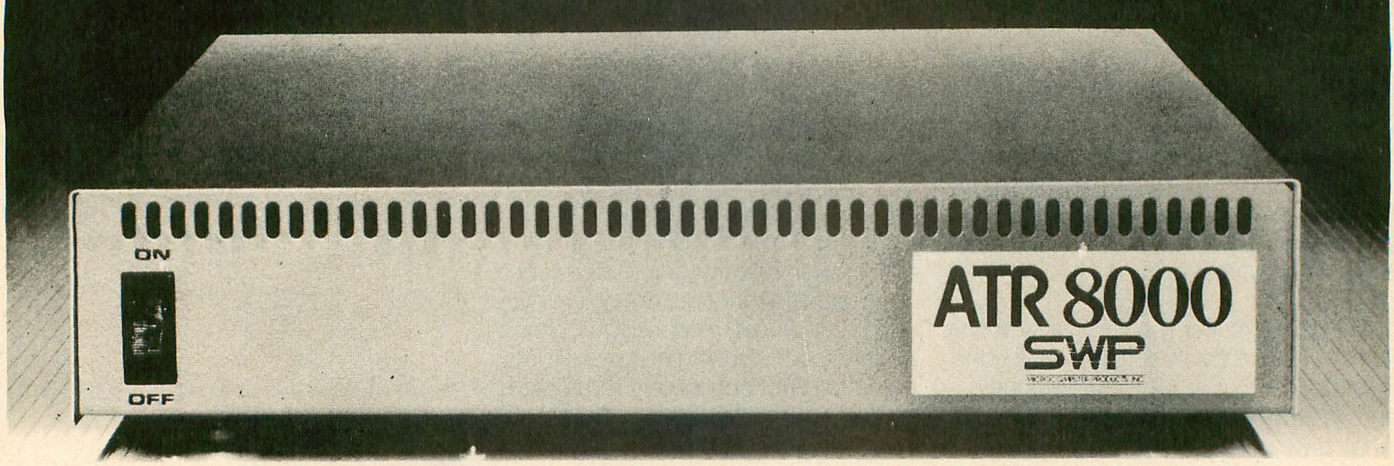
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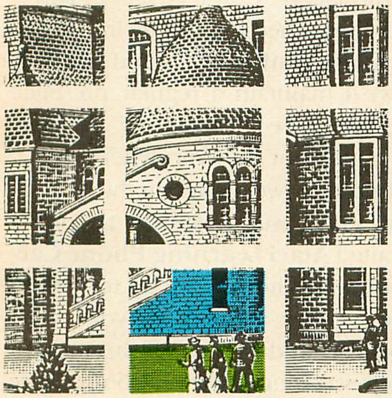
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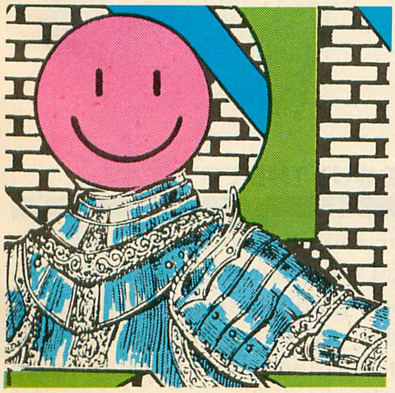














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# editorial

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**Antic** editors will be on-line regularly to respond to your notes and pass along the very latest Atari information.

## CES ATARI NEWS NIGHTLY

For example: As you read this, the Las Vegas Winter Consumer Electronics Show (CES) will be the hottest topic for Atari fans. This is the forum where Jack Tramiel has promised to introduce the new line of Atari computers.

Your local newspaper won't carry many details of the Atari developments, and the computer magazines can't bring you full information until months later. But now. . . **Antic** on CompuServe will file authoritative on-the-scene Atari reports every night during the CES.

On CompuServe, **Antic** Magazine has opened up interactive two-way communication with our readers. YOU are invited to participate. All it takes is a CompuServe subscription, your interest in the best personal computer, and a modem!

## P.S. PLATO TOO

We are continuing our active **Antic** Magazine notesfile on **Plato**, along with the new **Antic** presence on CompuServe. Control Data's Plato is still unmatched for on-line interactive learning, conferencing and graphics —we'll maintain a regular presence there too. (See "Plato Rising" in **Antic**, July 1984 for an overview.)

In fact, as we printed in the December, 1984 issue (page 9), the long-awaited **Atari Learning Phone Cartridge** that hooks you up to Plato is due to start arriving in your local stores around the end of this month. Keep watching **Antic** on CompuServe for latest details!

James Capparell
Publisher




## ABOUT THE COVER

This month's **Antic** cover was created on a Genigraphics 100D computer graphics system by Wes Jenkins, Assistant Art Director of Information Graphics, Information Technology Services of Stanford University.




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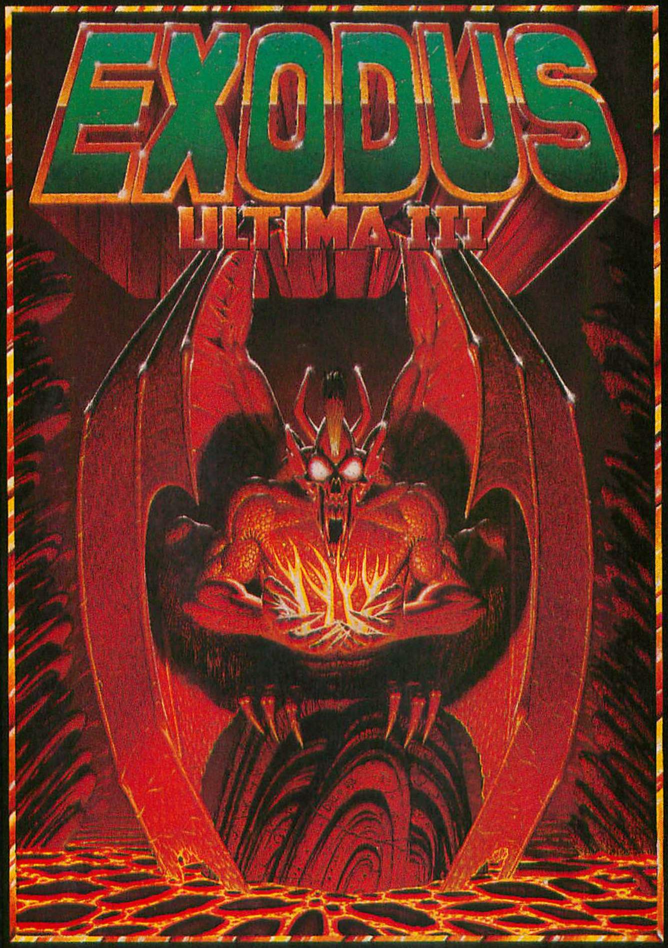
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*"Exodus: Ultima III is Lord British's magnum opus — so far. It's fun and exciting to play and constantly intriguing. And the ending is marvelously unexpected and not a bit disappointing — except that it is the ending, and as with a good book, you'll probably wish there were more."* — Softalk

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# i/o board

## GETTING YOUR HEAD ON STRAIGHT

My 410 recorder recently stopped loading correctly, although all the parts move properly. This has me baffled. Can you help?

Marge Hildebrandt
Simsbury, CT

*The problem sounds like improper alignment of the head in your tape recorder. See Carl Evans' article "Get Your Head On Straight," in the August 1983 issue of **Antic**.*—ANTIC ED

## CHAINED ATARI

Do all Atari compatible disk drives have "daisy chaining"? I would rather not have to plug and unplug peripherals as I transfer files from cassette to disk.

James Anderson
Oakdale, CT

*Every drive we've seen for the Atari (including Atari, Indus, Percom and Astra) has two ports, meaning they support daisy chaining. Thus, you can connect another peripheral to the drive instead of the computer, and the drive need not be turned on.*—ANTIC ED

## AVOIDING THE DOUBLE-FILENAME BLUES

Have you ever ended up with two files with the same name on a disk? If you try renaming them with option E on the DOS menu, both files get renamed. The problem can be renamed with a sector editor, but there is an easier way.

From BASIC, type the following statements:POKE 3111,76; POKE 3112,234; POKE 3113,18. Now go to DOS and use option E as usual for renaming a file. Only the first file found will be renamed.

Use option H (write DOS files) to save this modified DOS. Otherwise, restore things to normal by choosing option M (run at address) and entering E477 to reboot the system. Or you could turn the computer on and off.

Philip Altman
Huntington Beach, CA

## MODEMS IN MEXICO?

Can I use my modem in Mexico, and if I can, do I have to pay long distance fees?

Miguel Penichet
Guadalajara, Mexico

*You can use a modem anywhere you have a phone line and a power supply. Any phone line sufficiently free of static to permit conversation with another person is suitable for modem communication. (The modem transmits information by turning computer signals into audible sounds and sending those over the phone.)*

*You should make sure your local power voltage will work with you modem's adapter. Also, if you don't have access to modular (plug-in) phones, you may be stuck using an acoustic modem.*

*The telephone fees you pay depend on where you call. You will pay more to call Boston than you will to call next door. You are not paying to use the modem, only to make the phone call.*—ANTIC ED

## FOOTBALL, ANYONE?

I'm looking for a good football prediction/statistics program for the Atari. Does anyone have any ideas?

Mel Carian
San Francisco, CA

*If somebody turns in a good football handicapping program, **Antic** would be interested in publishing it.*—ANTIC ED

## BASIC DIRECTORY

Kudos to Kenny Ksajikian for his BASIC directory in November's I/O Board. Here are two modifications to eliminate the error message:

First, go to DOS. Then type

```
C [RETURN]
E:,D:DIR [RETURN]

CLR:DIM N$(17):CL.#5:O.#5,
6,0,"D:*.*":FOR I=1 TO 65:
I.#5,N$:?N$:I=I+65*(ASC(N$
(2))>32):N.I:CL.#5

[CTRL] [3]
```

Then, in BASIC, type

```
ENTER "D:DIR"
```

Bruce Noonan
Edmonds, WA

## HOME FILING MANAGER PRINT BUG

My Gemini 10X printer gives me "hieroglyphics" from **Home Filing Manager** even though I get excellent printouts on my other Atari Software. Your reply to B. Sonvico's letter in the July **Antic** didn't solve my dilemma. Won't you please help?

Leslie Lee
Carmel, CA

*This is just one of many letters **Antic** received in recent months concerning printout problems with Atari's Home Filing Manager software. The July, 1984 I/O board contained our one-line BASIC fix for the Alphacom 81 thermal printer. But readers were quick to inform us that this remedy did not work for most other printers commonly used with the Atari.*

*It's been a long frustrating job trying to find a solution. But we finally discovered that Home Filing Manager sends each character to the printer with the high-order (eighth) bit set. This is the same as adding the decimal value 128 to each character, or trying to print inverse characters.*

*Some printers, such as the Gemini 10X, contain graphics characters which are printed out by generating ASCII codes above 128. As a result, Home Filing Manager prints garbage on the Gemini and other printers having this feature.*

*How easily you can solve this problem depends upon your printer. Look through the printer manual for any reference to the "high-order bits" or "7/8 bit." Hopefully, it'll give you a way to turn off the high-order (eighth) bit. This might be done by transmitting printer control codes, or simply by flicking a DIP switch.*

*On the Gemini 10X, turn pin 3 of DIP switch 2 to the ON position. This will set the printer's interface to 7 bits and Home Filing Manager will work just fine. We had no problem printing on our Epson with the program, but you can turn off the Epson high-order bit by sending control codes:* [ESC] [=] —ANTIC ED

continued on page 12

# LOTSABYTES DECLARES WAR!

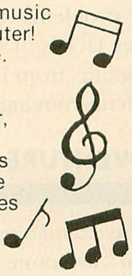
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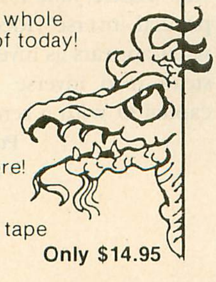
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# i/o board

## 1200 BAUD DIRECT CONNECT MODEM?

How can I get 1200 baud speed and upload/download capability with my Atari 1200XL and 835 direct connect modem? Are there plans for a 1200 baud direct connect modem?

Gary Johnson
Lubbock, TX

*There is no way to convert a 300 baud modem to 1200 baud with software. As for future plans, look for Microbits Peripheral Products to release an inexpensive 1200 baud modem capable of plugging directly into your Atari and phone line. When? We'll have to wait and see.*—ANTIC ED

## DOING MACHINE WORK

Many of your recent programs were made only for disk. Why is this so, and could you please make games for cassette and disk?

Brandon Brooks
North Tonawanda, NY

*We go to great lengths to assure that all our programs run on cassette as well as disk. In the case of some machine language submissions, the program was designed to run only on disk. For this reason, we prefer ML submissions to include a BASIC loader which will allow the program to use both storage devices. We don't always have time to devise such a loader ourselves.*—ANTIC ED


**STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION**

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|---|---|
| Title | ANTIC, The Atari Resource |
| Frequency of Issue | Monthly |
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| Total Distribution | 102,910 |
| Copies Not Distributed | 1,334 |
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| Total | 134,583 |


## DISABLED PROGRAMMERS

In the November issue, we ran a call for suggestions to simplify typing for disabled programmers, specifically seeking alternatives to commands where two keys must be pressed simultaneously, such as the [CONTROL] and cursor keys.

We'd like to thank those of you who quickly responded. We have passed along a machine language routine that filled the bill perfectly.

Several other suggestions involved hardware modification. One reader suggested installing foot pedals for the [CONTROL] and [SHIFT] keys. Another recommended installing lock keys, similar to the lock keys on typewriters. One reader uses a pair of flat, smooth sticks, bolted (hinged) together to form an "A". The unhinged ends have small, stick-on rubber feet to hit the keys.

Again, our thanks for the responses. —ANTIC ED

## COMPUTER-APPLIANCE INTERFACING

I wanted to let you know that there is someone out here who has built and uses the CAI described in **Antic**, April 1984.

My father uses an Atari 1200XL and a tone dial program I developed to simplify the extensive telephoning needed to run his bus tour organization. He uses the interface and Atari to make, dial and break the phone connection.

However, trying to track down the micro-relay recommended in the article wasn't easy—one company wanted upwards of $10 per relay. Fortunately, the 1985 Radio Shack catalog contains an "Ultra-compact SPST Reed Relay with Low-Current Coils," for only $1.49 (part number 275-232).

I bought joystick extension cord at Radio Shack (also new, $3.99, instead of $4.48 for the DE9S connector alone!), and wired it up.

My father and I both thank **Antic** for the article. All this proves that the Atari is more than just a game machine.

Robbin Lewis
Pittsburgh, PA

# help!

## ADVENT X-5

If you're having trouble saving your game (November 1984) to cassette, change line 4005 to read:

```
4005 IF PEEK(195)=130 THEN TRAP 4010: I$='C:":GOTO L
```

Again, this is for cassette owners only!

## BINARY SEPTEMBER

Despite a few letters mentioning problems with binary load files in the September issue of **Antic**, (Olympic Dash, Price's Painter and Fader), these programs run as published.

But new XL computer owners should note: If you only have the dreaded DOS 3, we suggest you obtain DOS 2.0S from almost any of the Antic Public Domain disks. DOS 3 owners should keep in mind the problems of incompatibility with other DOS's. It's not difficult to transfer programs from DOS 2 to DOS 3, but it is difficult moving in the other direction.

## ADVENTURE ISLAND

There is a missing piece of data in the program "Adventure Island" on page 56 of our November 1984 issue. Line 837 should read:

```
837 DATA CYBERNETIC TANK,999,0,6,50,
```

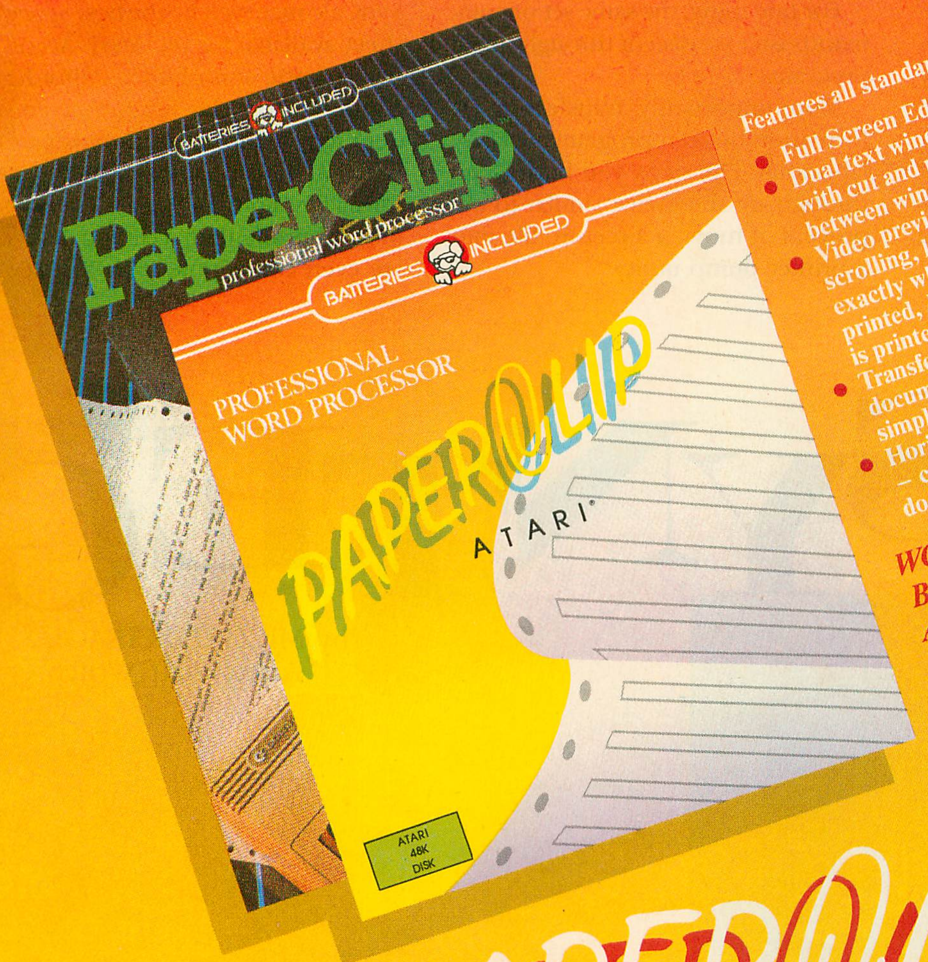
## EXPLORING THE XL

Here is a bug I found in "Exploring the XL," (**Antic**, June 1984). There was a misprinted inverse video zero. In line 230, what appears as inverse "Or" should instead read inverse "0r", replacing the capital O with a zero.

Peter Homann
Victoria, Australia

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# SYNTEG

by MICHAEL CIRAOLO
**Antic** Staff Writer

The arrival of Synapse Software's six-part business applications series is an important event in Atari computer history. For the first time, there's a full line-up of compatible business applications available for the best eight-bit 64K computer.

Because the series was first supposed to be marketed directly by Atari, Inc., Synapse stopped development on their own word processor and made the other packages compatible with **AtariWriter**. There's some possibility Synapse might bring out the new word processor in 1985.

The Synapse series consists of: spreadsheet **SynCalc** ($79.95), database manager **SynFile+** ($79.95), graphing/statistics combination **SynTrend** ($79.95), investment portfolio manager **SynStock** ($59.95), desktop calendar **SynChron** ($39.95) and modem software **SynComm** ($39.95). Each of these applications requires 48K memory and a disk drive.

All the products are exceptionally easy to use. Your [OPTION] and [SELECT] keys call up pop-up menus, so you don't need to memorize a lot of command codes. The manuals are outstanding, just about the best documentation ever written for Atari software. SynFile+ even comes with a tutorial disk.

## NOT TRULY INTEGRATED

Having lavished all this praise on the Synapse series, we now come to some bad news. It's not fully integrated, not in the same sense as non-Atari programs like Lotus 1-2-3 or Appleworks.

For one thing, the same set of commands isn't consistent throughout all programs.

More importantly, transferring information betwen programs is fairly laborious. The steps you have to go through are somewhat similar to the process of moving a picture file into a printer dump utility.

DIF—Data Interchange Format—is the link between SynCalc, SynFile+, SynTrend, SynStock . . . and AtariWriter. (SynChron and SynComm don't really need to be file-compatible with anything else.)

DIF formats files for listing to disk so they can then be called up for insertion into another program. Thus, you can create a DIF file for a column of data from SynCalc, save it to disk, and then call up that file for use in SynTrend.

The shortcoming is that to use DIF, you must specify and name each column being moved. You cannot simply lift a block of data from one program and put it into another. Handling data one column at a time is tedious and requires nitpicking attention to detail.

Quality of the different Synapse programs ranges from superb to so-what?—we will now examine each package on its own.

## SYNCALC

SynCalc may well be the best spreadsheet available for the Atari. According to **Antic** contributing editor Ken Harms (whose day job is Vice President for Finance and Administration of the American Cancer Society, California Division), SynCalc is easier and more versatile than VisiCalc. Its files are even compatible with VisiCalc.

SynCalc provides colorful pop-up menus for entering, editing, and manipulating data. The spreadsheet can be up to 128 columns across and 256 rows down. It automatically recalculates every relevant formula and number whenever you change an entry for a "what if" analysis. You can easily change or copy labels, formulae and data in any row or column.

Unlike VisiCalc, this spreadsheet allows you to widen any column that's too narrow for what you want to put inside it. Rows, columns and ranges of data can be added, averaged, sorted and subjected to trigonometric, logarithmic, financial and statistical calculations. Of course, data can be also saved to disk or printed out.

## SYNFILE+

SynFile+ is a database/filing system featuring pop-up menus, easy template creation and editing, with excellent utilization of the Atari's hardware. The documentation and tutorial disk are as good as they come. As a bonus, the program also accepts files from Synapse's earlier FileManager 800+.

SynFile+ will support any Atari-compatible disk drive (single, double, or Atari "dual" densities). The program supports a printer, up to four disk drives, the Axlon 128K Rampower card or up to three Mosaic 64K cards. Adding these cards will expand the flexibility and speed of the program, which is written in Forth with machine language subroutines.

To create a form for, say, inventory control, you can use a letters-and-numbers field to describe an item. Fields of dollars, dates and running totals will help keep track of prices and orders. SynFile+ also provides computed and conditional fields; this means you can automatically calculate results from data, enter predetermined data or find improper entries.

SynFile+ holds as many as 66 fields per record. Size limit of the template (format) for entering data is 21 lines of 80 characters each. Field names may be up to 31 characters long. You can use up to 16 disks per file.

You can sort or search as many as 16 fields at a time, for a total of 255 characters. SynFile+ allows you to search for wild cards too.

Searches and sorts can take up to one hour to run. The overall amount of data and records you can store depends on the size of the index (field which is being sorted—such as Last Name) and the amount of memory your Atari has available.

It takes a few keystrokes to use SynFile+. Between the menu and the screen-top status line, you always know where you are in the program. Use various menus to create files, edit formats, create templates, and sort.

# RATED SOFTWARE

## WANTED NOW: SYNREPORT

Unfortunately, SynFile+ has only limited report writing capabilities. This is a major shortcoming that limits the product's overall usefulness in business.

If you use the database without a printer—exclusively for displaying information on the screen—you'll have no problem using SynFile+. However, SynFile+ is unable to print page headers or footers. Even more significantly, you cannot edit data for reports.

In contrast, LJK's Data Perfect offers extensive options for creating printed reports, although it takes grim persistance and detailwork to actually produce these reports, because Data Perfect's documentation is among the worst on the planet.

Synapse claims there was not sufficient memory space available to overcome these SynFile+ constraints. But there are currently no concrete plans to produce a SynReport program which would make SynFile+ far more useful in professional applications.

## SYNTREND

The SynTrend package actually includes two program disks. SynGraph produces color graphs, while SynStat handles statistical calculations.

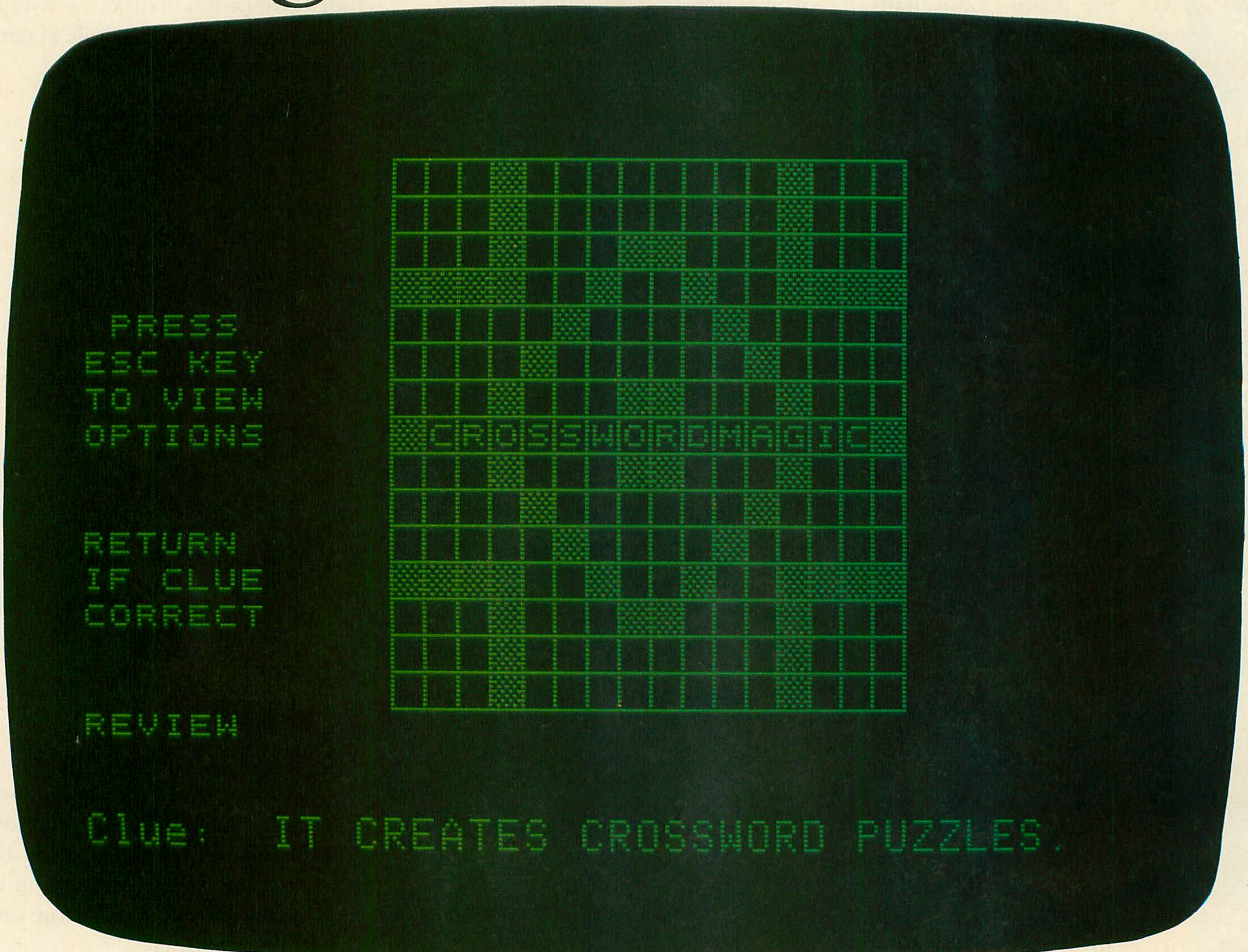
A SynGraph chart can display up to three factors. You have your choice of line and bar graphs, scatter plots and pie charts. Graphs are easily rescaled and labelled, allowing you to view data in multiple ways before saving or using a display.

Creating graphics is easy. Each menu screen used to produce a graph is clear and concise, and the instruction manual is well written and designed.

SynStat, like SynGraph, can accept data from direct entry or from any other software in this series. Once you enter a field of data you can choose to analyze it in either descriptive or regression format. Yes, prior knowl-

continued on page 17

# Only one program lets you create your own crossword, instead of filling in someone else's.



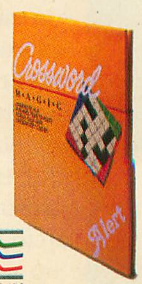

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## Crossword Magic from Mindscape

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**SYNTEGRATED SOFTWARE**
continued from page 15

edge of statistics is recommended.

In the descriptive form, you can get the average, standard deviation, variance, standard error, range, minimum and maximum for a set of data. You can also print out the results.

If you are examining the relationship between two sets of data—such as Antic sales and Atari prices—you will find the regression analysis feature a powerful tool. It allows you to measure the correlation between different data sets using multiple regression, residual analysis, and analysis of variance. The main regression screen displays the standard error and R-squared value for a regression run.

## SYNSTOCK

SynStock is for people who trade, analyze, or just follow stocks. The program requires a BASIC cartridge and combines spreadsheet, graphics and statistical functions.

SynStock follows as many as 50 stocks through 300 days of quotes (more than a year of actual trading days). If you have a modem, use the program to access CompuServe and download stock quotes. Or you can enter data from the newspaper. You can then display updated files in graphs, and perform moving average and oscillator analyses on the quotes.

You can print your portfolio and any of the graphs you've generated if you have a C.Itoh 8510A, NEC 8023, Star Gemini, or any Epson with Graph-Trak. (Other printers may also work, but these are specifically supported. SynGraph also supports these printers.)

## SYNCHRON

SynChron is an excellent desktop calendar program. You start by choosing two years for entries. One screen shows the year with months. Select the month and a new screen shows the month by days. A final selection allows you to enter up to 3,000 characters in each day's log.

You can designate words for future searches; for instance, you can tag deadlines, holidays, or birthdays and see a list of those dates and entries. The list can then be printed out.

SynChron is used by some as a diary because you can enter so much text in each date, and because there is a password protection scheme.

SynChron has excellent ease of use and plenty of bells and whistles. But how many people really need a $39.95 program that very elegantly does something which can also be done by a $10 appointment calendar or diary?

## SYNCOMM

SynComm is a telecommunications program for 300 or 1200 baud modems, allowing transmission of blocks of text, receipt and saving of incoming text, and standard modem dialing commands. This means SynComm is well-suited for use with bulletin board systems where you upload or download files.

SynComm's fancy extra is the fine scrolling display of incoming text. Unlike most programs on the market, SynComm moves up lines onscreen so smoothly that your eyes easily read without interruption.

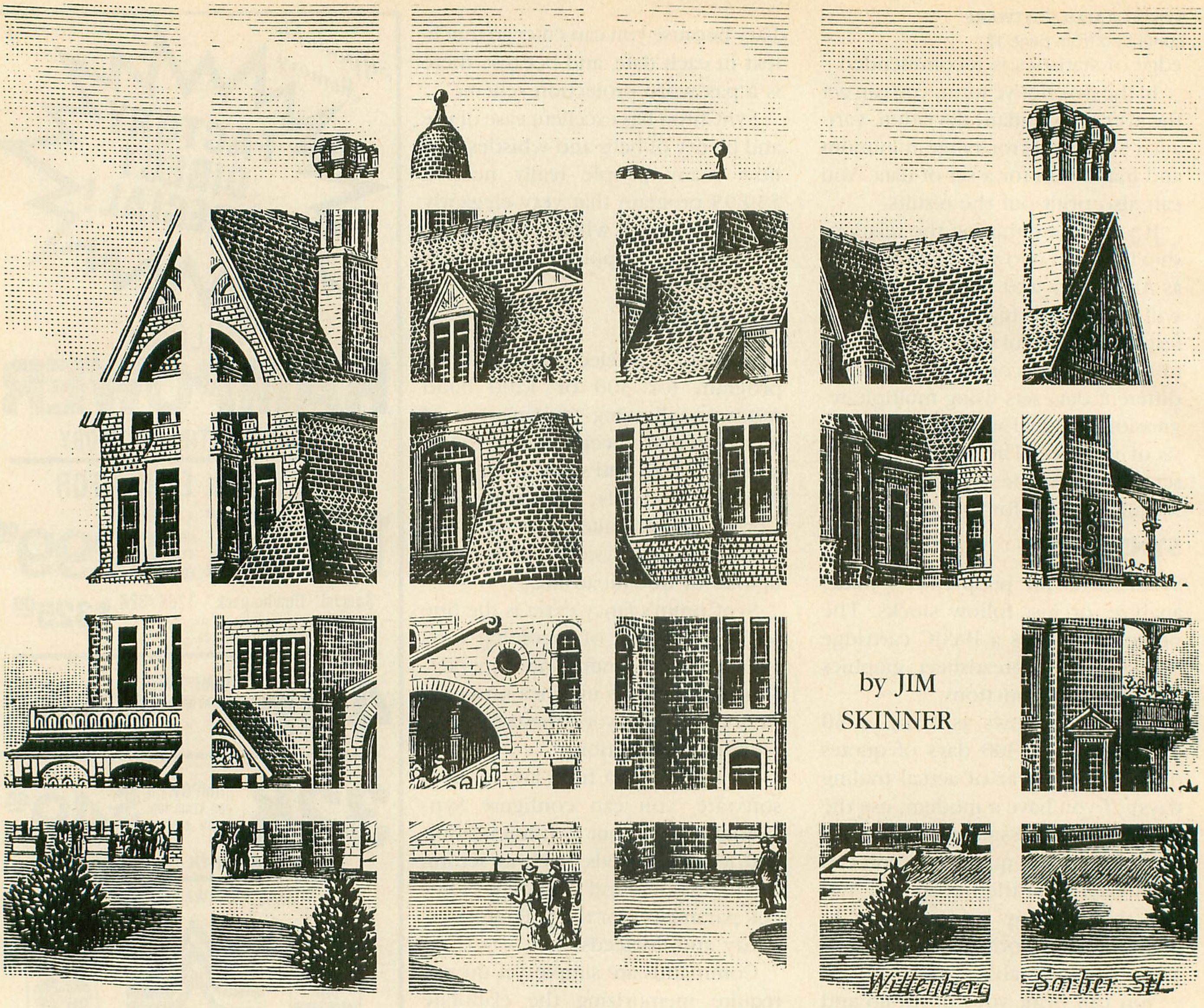
As you'd expect from any modem software, you can configure SynComm to suit your communication and terminal needs, such as setting full/half duplex and x-modem protocol, parameters for the 850 interface, parity and linefeeds.

Commands are simple yet do not require memorizing the elaborate mnemonic schemes used by some modem software.

## SUMMING UP

This new Synapse compatible applications software makes your Atari a more serious and versatile business computer than ever before. If you choose to buy a set, there are special prices available for user groups and members of the CompuServe Atari special interest group. SynCalc, SynFile and SynTrend can be purchased for $59 each or all three for $150. The other three programs may be obtained for $34 apiece or all three for $90. Synapse will provide back-up disks for $20 with valid registration.

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by JIM SKINNER

APX 1983 prize-winner
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# HOME LOAN ANALYZER

*For the first time ever, a former Atari Program Exchange product is being reprinted in* **Antic**. *Home Loan Analysis won first prize in the APX summer 1983 contest. The menu-driven BASIC program makes it easy to track your mortgage or car payment status—runs on all Atari computers with 24K disk or 16K cassette.*

The Home Loan Analysis program swiftly and easily calculates everything you'd need to know about a home mortgage—or about virtually any long term loan such as automobile payments.

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- What your monthly payments will be.
- How much each payment reduces the amount you owe.
- How much interest you have paid.
- How much you can afford to borrow.
- Which loan source gives you the best deal.
- What is the current value of your property.

The program also calculates appreciation rate and amortization schedule. All results can be printed out or displayed on the screen.

The information you will need to enter into the program is: interest rate, original purchase price, down payment, balloon payment, time length of the loan. It's also helpful, though not necessary, to know when the first payment was made and a recent appraised value. Home Loan Analysis does not calculate the tax and insurance that are part of your monthly payments.

## STARTING OUT

Type in the program, checking each line with TYPO II, and SAVE a copy before you RUN it. When the title screen has finished loading, press [START] to move to the main menu screen. You will see:

```
Purchase Price . . . . . . . . . . 25000
Down Payment . . . . . . . . . 2500
Interest Rate . . . . . . . . . . . . 11.9
Balloon Payment . . . .  => 0
Length of Loan in Years . . . 10
Monthly Payment . . . . . . . . 321.51
Year of First Payment . . . . . 1980
Month of First Payment . . . 1
Amortization Year . . . . . . . 1994

Calculate Amortization Schedule
Appraised Value . . . . . . . . . 55000
Appraised Year . . . . . . . . . . 1980
Appreciation Rate . . . . . . . 6.36
Resale Value . . . . . . . . . . . . 90000
Resale Year . . . . . . . . . . . . 1990

Print This Information Print
------------------------------------------
OPTION=up        SELECT=down
START=compute
Type a number and then press
RETURN
------------------------------------------
```

Home Loan Analysis comes with pre-set values. You change these to your own figures by following the prompts in the box at the bottom of the screen. Only typed-in numbers and decimal point will be recognized by the program.

[OPTION] moves the blinking cursor arrow up and [SELECT] moves the cursor down. Enter all the factors you want to change, pressing [RETURN] after each entry. Then move the blinking arrow next to one of the values you want to have calculated and press [START].

For example, the program can calculate Monthly Payment and Appreciation Rate. But if you enter your own Monthly Payment, the program can calculate maximum purchase price with your specified Down Payment, Balloon Payment and Interest Rate.

If you don't know your Year or Month of First Payment, just type [1] on those menu lines.

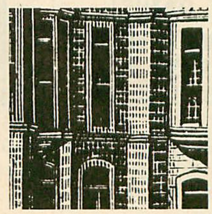
You can get a 12-month Amortization Table that shows you how much of each payment goes to reduce the loan, how much pays interest, and what the remaining balance is each month. Type in a year on the Amortization Year line, move the blinking arrow down to Calculate Amortization Schedule and press [START].

Any 40 or 80 column printer can be used to give you a printout. Press [START] when the blinking arrow points to Print This Information.

## SAMPLE USE

Here's an example of how the program would work: Suppose you're considering buying a $75,000 house with $6,000 down payment, at 15% interest for 30 years. Type these four numbers on the appropriate lines, pressing [RETURN] after each entry. Then press [START]. The correct monthly payment will be calculated as $872.47.

To see what the change would be if you got a 13% loan, type [1] [3] on the Interest Rate line and press [START]. Monthly Payment will be recalculated to $763.28.



*Jim Skinner lives in Orlando, Florida where he has 10 years of mainframe computer experience with AT&T Information Systems. He's been writing Atari programs since 1981.*

Listing on page 38.

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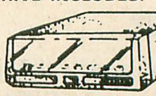
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*Your Atari with 48K and disk can now take over the unpleasant duty of preparing annual income tax returns. This template (spreadsheet model) requires SynCalc software—and a working knowledge of the program. A printer is optional.*

A spreadsheet is a perfect tool for preparing your own income tax returns—or picking up some extra money by preparing other people's returns.

Until 1984, the only spreadsheet available for the Atari was an early version of **VisiCalc** that lacks the IF command—which means it can't really do professional-level income tax preparation.

But now for less than $69.95, Synapse Software's state-of-the-art **SynCalc** gives Atari users a spreadsheet that's about 98 percent as quick and powerful as the $495 Lotus 1-2-3 program I use at my office on a $4,000 IBM PC system.

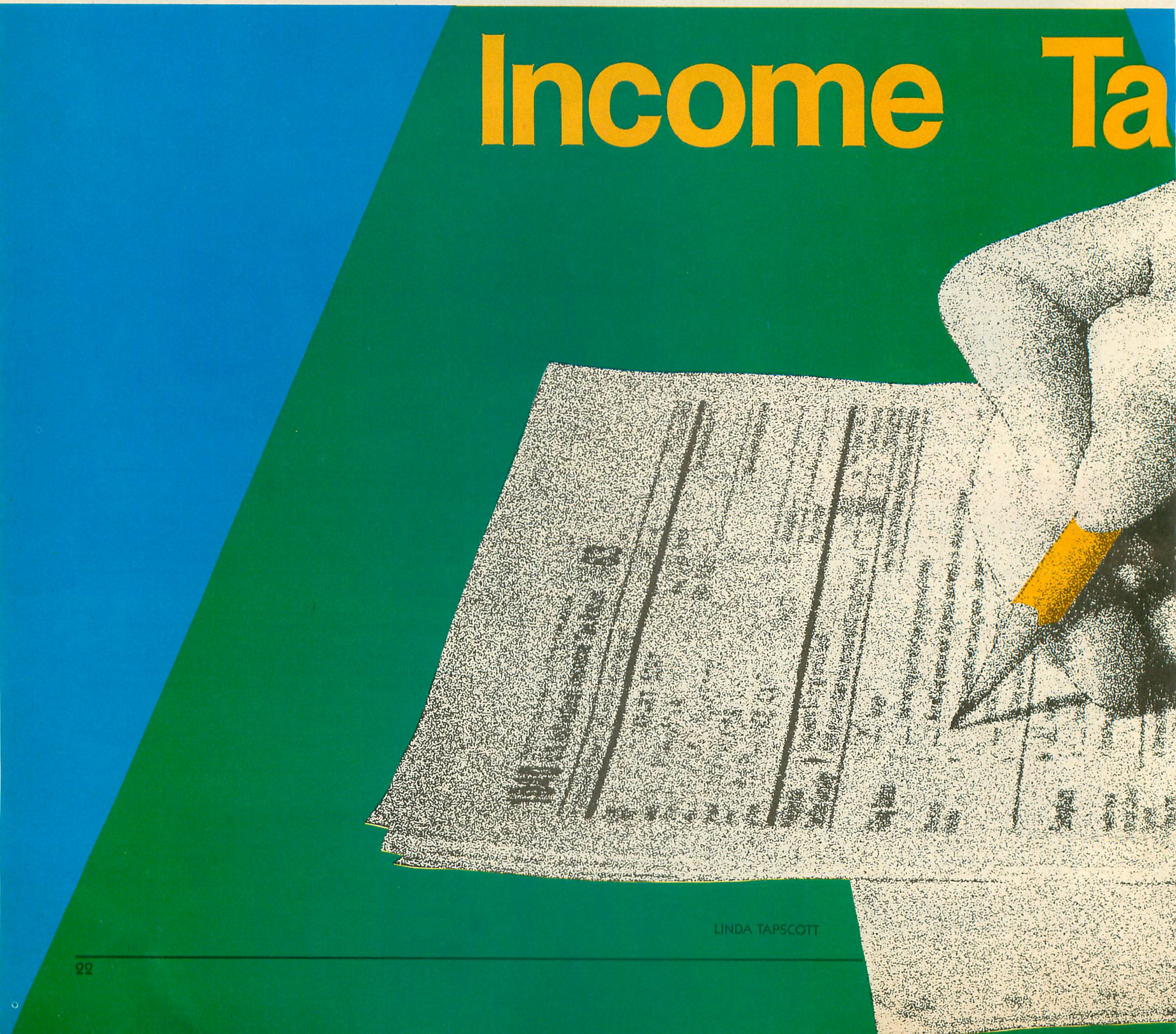
And SynCalc is a lot easier to learn—count on 40 hours to get the hang of Lotus 1-2-3. But even if you've never used a spreadsheet before, you should be able to work through the SynCalc manual tutorial in a few hours and understand the program well enough to operate this spreadsheet tax template.

The template does all necessary math for calculating Federal personal income taxes on the 1040 Long Form. Naturally, the template recalculates all changes with ease, so you can check out alternative tax reduction strategies to your heart's content. Sorry, but a spreadsheet cannot explain our tax laws or suggest deductions.

## GETTING STARTED

You will need the 1984 IRS tax instructions and the various 1040 forms close by your side when you use the templates. And please examine the completed results with great care—If you have any doubts about the accuracy of what the spreadsheet tells you, get advice from a tax professional. Computer entry mistakes and even programmer errors have

# Income Ta



LINDA TAPSCOTT

been known to occur. So Antic Publishing and the author disclaim responsibility for any mistakes that might be made in your tax payments as a result of using this template.

As you start working with the template you will quickly notice that it says 1983. Unfortunately, as I write this (around Halloween) the 1984 IRS forms haven't been released yet.

But if you enter the template as it stands, you can test it out on the 1983 forms you filed last year. **Antic** will publish the 1984 updates as soon as the IRS comes through —certainly in plenty of time for the April 15 filing deadline.

And I don't expect the 1984 changes to require a great deal of template retyping.

### 6 FORMS INCLUDED

This template is narrow but quite long. It consists of some 240 rows arranged in four columns.

The template starts with main Form 1040. Then below it are Tax Tables X, Y, & Z, Schedule A (Itemized Expenses), Schedule B (Interest & Dividends), Form 2441 (Child Care Deduction), and Schedule G (Income Averaging).

All these fit on one spreadsheet, so the totals from any calculation—for instance, income averaging—are automatically included in the 1040 "Tax Due" line.

You don't have to type in any schedules or forms that you don't actually need—the 1040 will still work. If you type in sections you later decide not to use, just leave them blank.

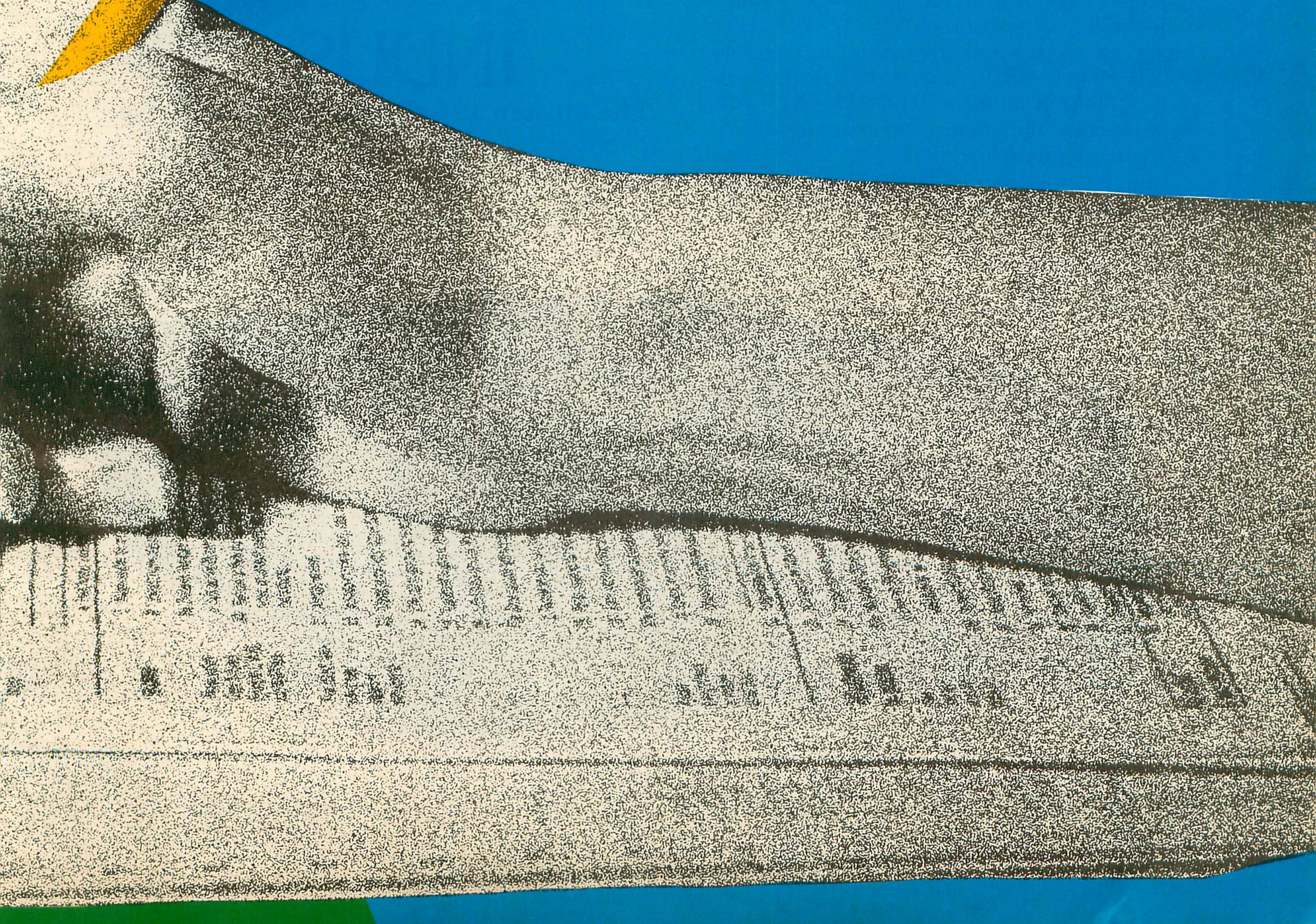
Six additional schedules or forms are available on disk. These include: Schedule W (Working Married Couple Deduction), Schedule C (Business Income & Expense), Schedule SE (Self Employment Tax), Form 2106 (Employee Business Expenses), Schedule D (Capital Gains), and Schedule E (Rents & Royalties).

In fact, to make everything easier,

continued on page 25

# x Spreadsheet

By K. W. HARMS



# Turn your Atari into a Ferrari.

Introducing the all-new 1984 Indus GT™ disk drive. The most advanced, most complete, most handsome disk drive in the world.

A flick of its "Power" switch can turn your Atari into a Ferrari.

**Looks like a Ferrari.**
The Indus GT is only 2.65" high. But under its front-loading front end is slimline engineering with a distinctive European-Gran flair.

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So see and test drive the incredible new 1984 Indus GT at your nearest computer dealer soon.

The drive will be well worth it.



INDUS™

**The all-new 1984 Indus GT Disk Drive.**

*The most advanced, most handsome disk drive in the world.*



continued from page 23

the **Antic** disk contains all 12 forms above — complete with any necessary 1984 updates. (The 1984 information will be available by the time this gets into print.) See the nearby order blank.

Oh yes, this tax template disk is deductible!

## FORMAT SETTINGS

However, if you're typing in the template, let's get started. Load up your SynCalc and format a blank disk for data. [OPTION] and LOAD/SAVE gets you to the disk FORMAT command.

Before typing anything, set all column widths to seven except column E—which should be set to nine. Set the GLOBAL FORMAT to PRECISION 0, COMMA (these get rid of pennies and insert commas). To speed up data entry, issue the command GLOBAL RECALCULATE MANUAL. Also set calculation to ROWS.

To simplify entering the template, I've placed all labels in columns A and B. All figures and calculations are in columns D and E. (Column C holds text overflow.)

While entering titles in columns A and B, set FORMAT JUSTIFY LEFT. When entering the numbers and formulas in columns D and E, set FORMAT JUSTIFY RIGHT.

I'd suggest starting to type at cell A1 and working down column A using SynCalc's automatic cursor movement. Then go to the next column and enter the titles (some titles appear in column A on other forms).

If a title extends past its column, just type it in—SynCalc's overflow feature handles the long material automatically! (But you do have to erase each overflow cell manually, if you move the title.)

Reading from the left, each Template Section starts with the SynCalc row number. (Don't type in these row numbers.) Then comes the tax form line number. You MUST enter all numbers and formulas in the cells shown—otherwise the template just won't work. However, titles can be changed if you wish.

**A memory conservation tip:** SynCalc uses 16 bytes to store every number. Text entries take only four bytes plus one byte per character. So, unless you will use a number in a calculation, make it a text entry. On the 1040, for instance, all those form line numbers should be text (start each entry with a quote).

## FILLING THE BLANKS

The next step is to enter all the zeros and FORMAT $ the indicated cells. The zeros "hold open" the cells for formulae and values that will come later. All the zeros are in columns D and E. As you enter them you'll probably want to use this undocumented tip—the command /K toggles automatic cursor movement on and off!

Now that the template format is set up, type in Listing 1 to enter each cell formula and the remaining titles. The listing shows each cell address followed by the entry. Do not type a cell address (such as E169) in the first three or four spaces at left. Instead, go to that cell and type in the formula. You'll be typing over the space-holding zeros you entered earlier. A formula element like E179 is not text—type it as +E179 so that SynCalc will consider it a numeric.

The six Template Sections all fit on one spreadsheet—but just barely (19K of 21K available memory). So you may have to save off the file and reload it to free up unused memory. SynCalc's housekeeping table gets added onto for each cell used. SAVE/LOAD does the garbage collection to delete unused entries.

The total cells are FORMAT $ for looks and clarity. I also recommend putting a protection on every formula. Use the FORMAT OVERRIDE command. This will prevent writing over the formulae during data entry.

## SHORTCUTS

Statement E68 likely won't fit if you type spaces between words— eliminate the spaces. This formula uses SynCalc's absolute address braces [ ] to let advanced users COPY it to cells E71 through E75 and patch up the table references (there wasn't enough space to absolute the LOOKUP table).

Another shortcut is to type in cells E84 through E90 (or COPY and patch) and then COPY the entire block to E99 and then to E114. This copying should cut typing time substantially. Just be sure that the copied formulae refer to the correct spaces by moving the cursor to each cell and pressing RETURN to edit. Would you believe that *VisiCalc won't let you edit an entry?* That's right, you must type in the whole thing again.

The formula in cell E164 illustrates multiple IFs, each with multiple conditions. SynCalc allows linking many conditions by AND or OR. Always put the conditions between the IF and the THEN. Place the next IF after the ELSE, nowhere else. These linked IFs and conditions give you the logic power needed to handle almost any problem.

After the complete spreadsheet template is entered, save a blank copy under a name like BLNK1040 before entering any data. Calling up the blank will let you do multiple returns, saving each with a different filename.

**Another tip:** In SynCalc you can move the cursor arrows without holding down [CONTROL].

## PRESS 4 TIMES

SynCalc calculates by rows or columns, so the spreadsheet must be calculated at least four times. Press [START] four times after changing any figure and before using the results.

You don't need a printer to benefit from the program. Just copy the figures from the screen to your printed IRS forms. But if you do use a printer, SynCalc lets you enter control characters in any cell. This lets you set all sorts of special printout effects such as boldface, underlines, double-width, boxes and arrows, page breaks, etc.

So, good luck with your '84 taxes and may your refunds be big ones.

*__Antic__ Contributing Editor Ken Harms has often appeared in these pages, writing about business applications or Logo educational software. He is Vice President for Finance and Administration of the American Cancer Society's California Division.*

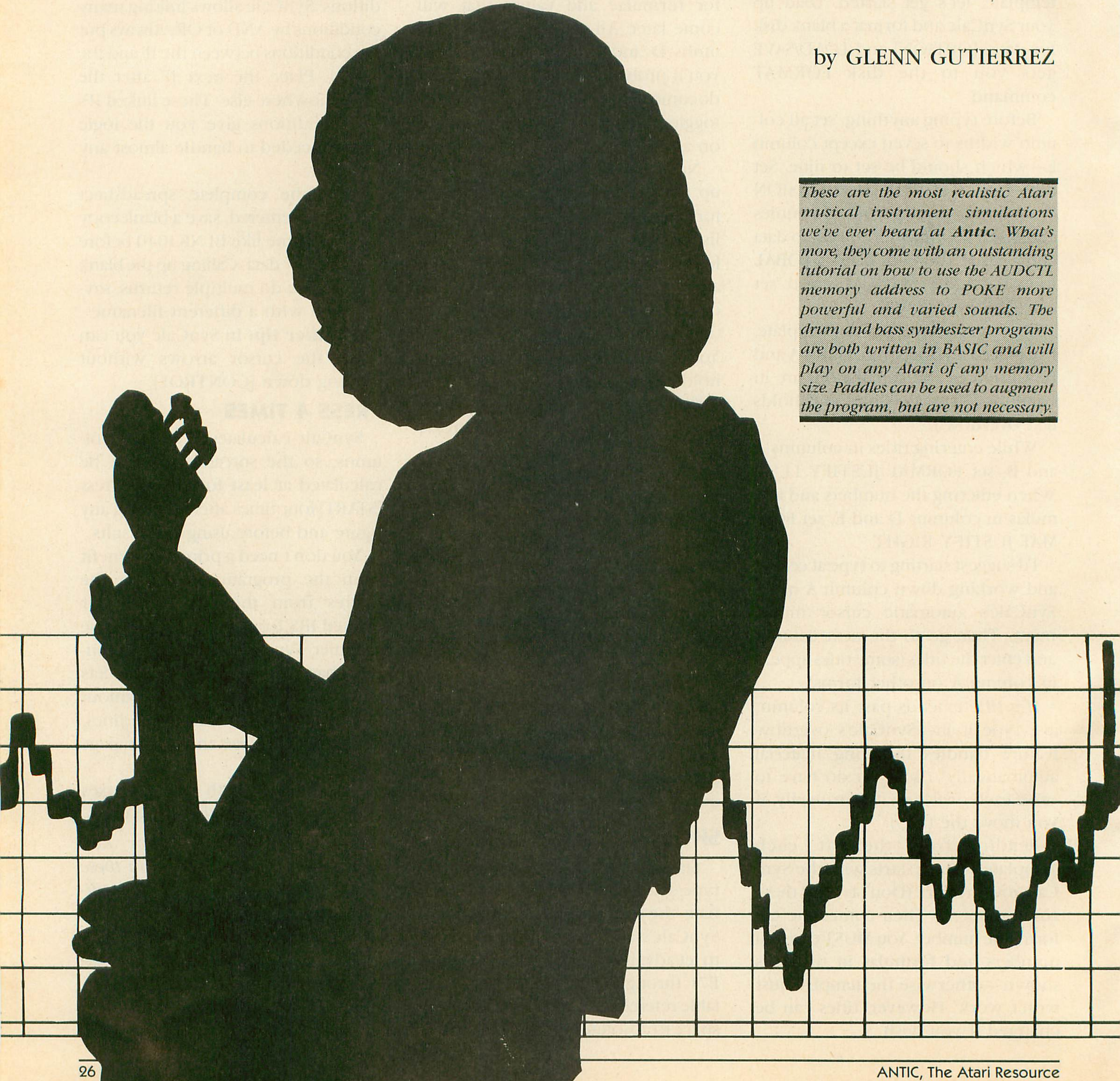
Listing on page 43.

## Powerful AUDCTL Rhythm Section

# DRUM SYNTH/ BASS SYNTH

by GLENN GUTIERREZ

*These are the most realistic Atari musical instrument simulations we've ever heard at* ***Antic****. What's more, they come with an outstanding tutorial on how to use the AUDCTL memory address to POKE more powerful and varied sounds. The drum and bass synthesizer programs are both written in BASIC and will play on any Atari of any memory size. Paddles can be used to augment the program, but are not necessary.*



Who hasn't sometimes daydreamed about being a musician? We'd all like to be in the spotlight at a rock concert or classical recital — or at least express ourselves in our favorite styles of music.

It's surprisingly easy to make your Atari into a drum synthesizer or electric bass synthesizer. Hooked up to your stereo, these synthesizers will sound remarkably professional.

## USING DRUM SYNTH

Type in Listing 2, check it with TYPO II and SAVE a copy. When you RUN it, the prompt, "Press START or any key," will appear at the bottom of the screen. Once you press [START], or any key except [BREAK], the screen will turn solid green. Now you can play.

*Figure 1* shows you which keys control the different sounds in your synthesized drum set. As you'll see, I programmed at least two keys for each sound, choosing a pattern that lets you play any drum with either your left or right hand.

Pressing [START] while you're set up to play toggles you between fast and slow modes. Stop the program at any time by pressing [BREAK]. Type END [RETURN] and all of the sound channels will be turned off.

If you wish to edit any of the sounds, you can initiate them by GOSUBing to their line numbers, but the Graphics Zero screen will slow them down considerably. Remember this when making up new sounds.

Figure 1
**Drum Synth Keyboard**

| KEYS | | SOUND |
|---|---|---|
| A S + * | | BASS DRUM |
| D | ; | SNARE DRUM |
| F | L | DRUM-SYNTH |
| G | K | HAND CLAP |
| Z | X | TOM 1 (LOW) |
| C | V | TOM 2 |
| B | N | TOM 3 (MEDIUM) |
| M | , | TOM 4 |
| . | / | TOM 5 (HIGH) |
| ART | | REPEAT TOM (PADDLE(0)=TONE) (PADDLE(1)=SPEED) |
| Q | = | REPEAT HIGH HAT CYMBAL (PADDLE(1)=SPEED) |
| W | - | HIGH HAT (CLOSED) |
| E | P | HIGH HAT (OPEN) |
| R | O | CRASH CYMBAL |
| T | I | CRASH CYMBAL (SLOW DECAY) |
| RETURN | | DRUM DEMO (BASS/SNARE) |

## INSIDE THE PROGRAMS

There are two main things I needed to do to make these programs sound good. The first was getting the fastest speed possible from BASIC. One way I did this was to put the title page subroutine on line 30000, while the keyboard reading loop is at the very beginning. So the computer responds more quickly. I also turned the screen off during playing, so the computer doesn't need to take time telling your TV to draw something.

The second important thing I did was POKEing the sounds on—instead of working with the more commonly used SOUND commands.

These two statements are exactly alike:

```
SOUND 0,200,10,8
POKE 53760,200:POKE 53761,168
```

The locations for POKEing sounds begin at 53760. Each sound requires only two addresses. The first is the sound's pitch and the second is a combination of distortion and volume.

Consider these two commands:

```
SOUND 1,PITCH,DISTORTION,
VOLUME
POKE 53762,PITCH:POKE 53763,
(DISTORTION*16)+VOLUME.
```

Notice that the registers used this time were 53762 and 53763. (See *Figure 2* for a complete listing of SOUND commands and their equivalent POKEs.) This is because we are using voice one instead of voice zero. The location 53763 is POKEd with the value of the distortion multiplied by 16, then added to the volume. If you only wish to change the volume or the pitch independently, this is a much faster method.

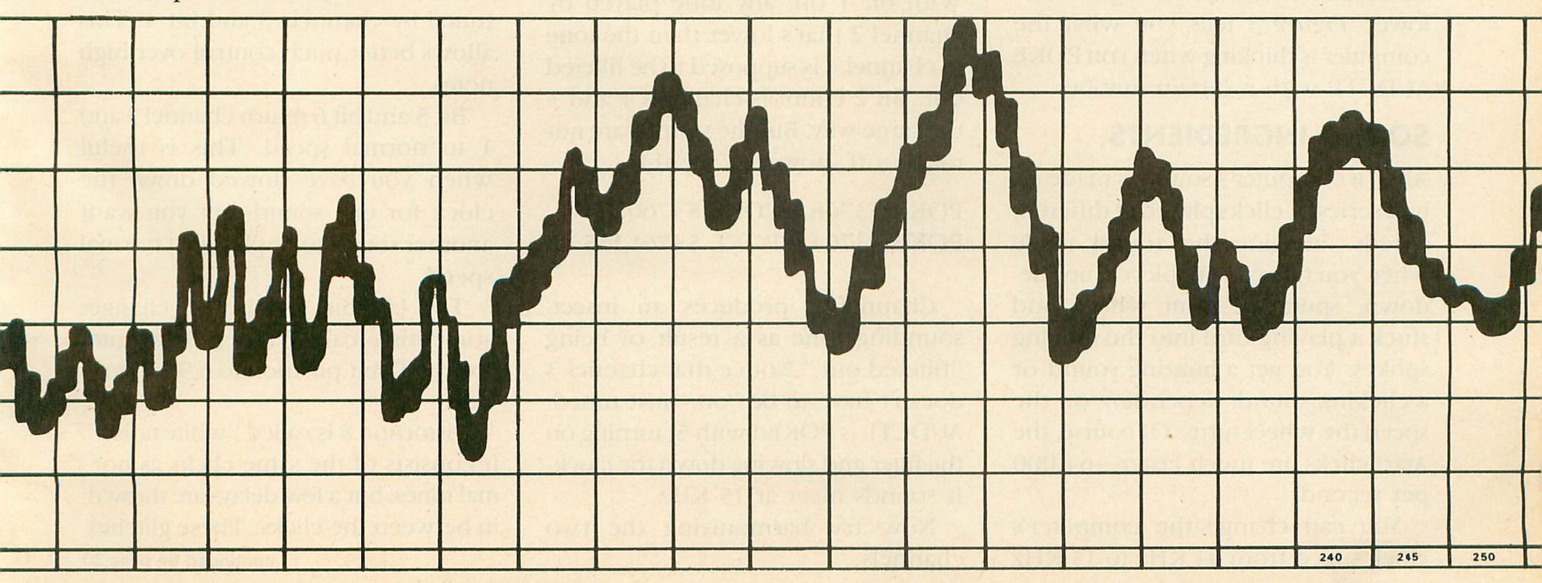
## AUDCTL VARIATIONS

AUDCTL (memory location 53768) is not normally associated with Atari sound, but it is extremely useful.

Do you think that SOUND 0,255,10,8 is the deepest pitch your computer can generate? Try the same command followed by POKE 53768,1. Much lower! To get back to the original tone, type POKE 53768,0 or SOUND 0,255,10,8.

At every SOUND command, the

continued on next page



computer sets AUDCTL to zero. Therefore the following is impossible without detecting the changing of AUDCTL. Try typing it in.

```
FOR J=255 TO 100 STEP -1:
SOUND 0,J,10,8:POKE 53768,1:
NEXT J:SOUND 0,0,0,0
```

In BASIC your Atari generates the normal tone then changes AUDCTL slowly enough to be audible. It doesn't sound very nice. The computer only resets AUDCTL when it sees SOUND, not when it sees POKE, so let's POKE a new sound in without changing AUDCTL. Now try this:

```
POKE 53768,1:POKE 53761,168:
FOR J=255 TO 100 STEP -1:
POKE 53760,J:NEXT J:POKE 53761,0
```

Notice how we first POKE AUDCTL, then POKE the distortion and volume, because they don't change throughout the whole FOR-NEXT loop. Because the distortion and volume are already set, all we have to change inside the loop is the pitch, and that only requires one POKE. Thus POKEing becomes very useful when you need maximum speed in a sound program.

The last command is also simpler than SOUND. All we wish to do is turn the sound volume off. We don't need to change the pitch. POKE 53761,0 turns off that sound the same way SOUND 0,0,0,0 does. But the overall process is much faster.

Of course, you can do much more with AUDCTL than just make the tone lower. *Figure 3* tells you what the computer is thinking when you POKE AUDCTL with a certain number.

## SOUND INGREDIENTS

All of a computer's sound is made up by a series of clicks played at different speeds. Imagine the sound made when you turned your bicycle upside-down, spun the front wheel, and stuck a playing card into the moving spokes. You get a buzzing sound or a clicking sound, depending on the speed the wheel turns. Of course, the Atari clicks are much faster—64,000 per second.

You can change the computer's clock speed from 64 KHz to 15 KHz by turning on bit 0 of AUDCTL (See *Figure 3*). This will slow down the clicks and lower the pitch of the sound.

Bits 1 and 2 of AUDCTL are strange. With bit 1 on, any tone played by channel 2 that's lower than the tone in channel 4 is supposed to be filtered out. Bit 2 controls channels 1 and 3 the same way. But the sounds are not totally off, however. Try this:

```
POKE 53768,5:POKE 53760,200:
POKE 53764,0:POKE 53761,165
```

Channel 1 produces an insect-sounding tone as a result of being "filtered out." Notice that channel 3 doesn't have to be "on," just tuned. AUDCTL is POKEd with 5, turning on the filter and slowing down the clock. It sounds nicer at 15 KHz.

Now try harmonizing the two channels:

```
POKE 53768,5:POKE 53760,200:
POKE 53764,199:POKE 53761,165:
POKE 53765,165
```

Bit 3 causes channel 4 to be fine tuned by channels 3 and bit 4. This allows better pitch control over high notes.

Bit 5 and bit 6 return channel 3 and 1 to normal speed. This is useful when you have slowed down the clock for one sound, but you want another sound to be played at normal speed.

The last bit, number 7, changes something called the poly-counter from a 17-bit position to a 9-bit position.

Distortion 8 is called "white noise." It consists of the same clicks as normal tones, but a few delays are thrown in between the clicks. These glitches

continued on page 30

Figure 2
**POKE & SOUND**

| Voice | SOUND Command | Equivalent POKE |
|---|---|---|
| 1 | SOUND 0,P,D,V | POKE 53760,P:POKE 53761,(16*D)+V |
| 2 | SOUND 1,P,D,V | POKE 53762,P:POKE 53763,(16*D)+V |
| 3 | SOUND 2,P,D,V | POKE 53764,P:POKE 53765,(16*D)+V |
| 4 | SOUND 3,P,D,V | POKE 53766,P:POKE 53767,(16*D)+V |

Figure 3
**AUDCTL Variations (Memory Location 53768)**

| bit # | AUDCTL | Result |
|---|---|---|
| - | 0 | (normal) |
| 0 | +1 | switches main clock base from 64 KHz to 15 KHz(which lowers the pitch) |
| 1 | +2 | high-pass filter on chan 2, clocked by chan 4 (any chan 2 tone lower than chan 4 tone will be filtered out) |
| 2 | +4 | high-pass filter on chan 1, clocked by chan 3 |
| 3 | +8 | joins channel 4 to channel 3(16 bit resolution) (allows better pitch control) |
| 4 | +16 | joins channel 2 to channel 1(16 bit resolution) |
| 5 | +32 | clocks channel 3 with 1.79 MHz(1.79 MHz is normal speed) |
| 6 | +64 | clocks channel 1 with 1.79 MHz |
| 7 | +128 | makes the 17 bit poly-counter a 9 bit one(changes the noise distortion sounds) |

Try experimenting with different values.

Figure 4
**Internal Key Codes**
**(Memory Location 764)**

**KEY CODES**

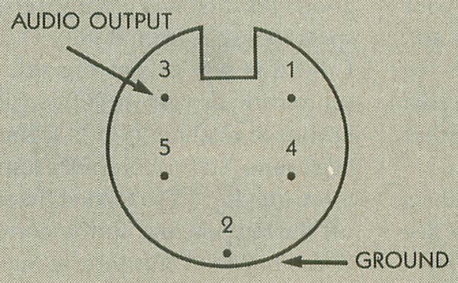
| | | | |
|---|---|---|---|
| 0 | L | 28 | ESC |
| 1 | J | 29 | 5 |
| 2 | ; | 30 | 2 |
| 5 | K | 31 | 1 |
| 6 | + | 32 | , |
| 7 | * | 33 | SPACE |
| 8 | O | 34 | . |
| 10 | P | 35 | N |
| 11 | U | 37 | M |
| 12 | RETURN | 38 | / |
| 13 | I | 39 | ATARI |
| 14 | - | 40 | R |
| 15 | = | 42 | E |
| 16 | V | 43 | Y |
| 18 | C | 44 | TAB |
| 21 | B | 45 | T |
| 22 | X | 46 | W |
| 23 | Z | 47 | Q |
| 24 | 4 | 48 | 9 |
| 26 | 3 | 50 | 0 |
| 27 | 6 | 51 | 7 |
| | | 52 | BACK S |
| | | 53 | 8 |
| | | 54 | < |
| | | 55 | > |
| | | 56 | F |
| | | 57 | H |
| | | 58 | D |
| | | 61 | G |
| | | 62 | S |
| | | 63 | A |

255 no key pressed

Figure 5
**Key Assignment Numbers**

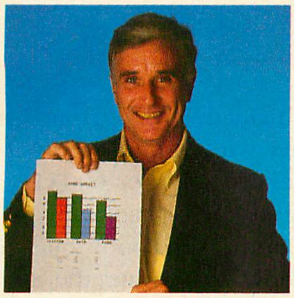
| DATA numbers | Line number |
|---|---|
| 0-9 | 31000 |
| 10-19 | 31001 |
| 20-29 | 31002 |
| 30-39 | 31003 |
| 40-49 | 31004 |
| 50-59 | 31005 |
| 60-63 | 31006 |

Figure 6
**5-Pin DIN Plug**



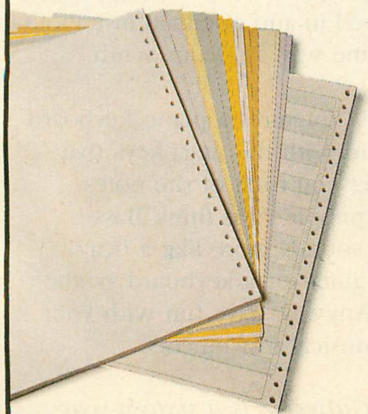
# COLOR

## The OKIMATE 10 Personal Color Printer's got it for $238.



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Now your Atari personal computer has new meaning. Because OKIMATE 10 can bring the information on your screen to life. Printing on plain paper. In brilliant color. For very little green.

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Just plug the OKIMATE 10 into your Atari personal computer with the PLUG 'N PRINT package.* And print. It's that easy.

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For $238 you get both the printer and the PLUG 'N PRINT package plus



everything you need to print: black ribbon, color ribbon, data cable, PLUG 'N PRINT control cartridge, "Learn-to-Print" program, "Color Screen Print" software package, computer paper, and an easy to read handbook.



**OKIDATA**
an OKI AMERICA company
Mt. Laurel, NJ 08054

Available at retailers everywhere.

Atari is a registered trademark of Atari Inc.

*PLUG 'N PRINT packages for Atari computers sold separately. Atari requires disk drive and 48K memory.

**DRUMSYNTH/BASS SYNTH**
continued from page 28

are set in a pattern and repeated every 17 clicks so that the sound remains constant. By setting bit 7, you cause the pattern to be repeated every 9 times, making the noise a little more basic. Its use is up to you.

## MIX YOUR OWN

Now, on to the program structure. It's not really complicated. All of the sound effects begin at line 100 and have a REM statement declaring what the sound is supposed to resemble.

It's easy to mix your own sounds too. First, let's discuss the keyboard assigning process. A series of DATA statements begins on line 31000. There are 64 numbers in all. Each line has ten numbers ranging from 0 to 9 for each DATA statement. (Except line 31006 which ranges from 0 to 3)

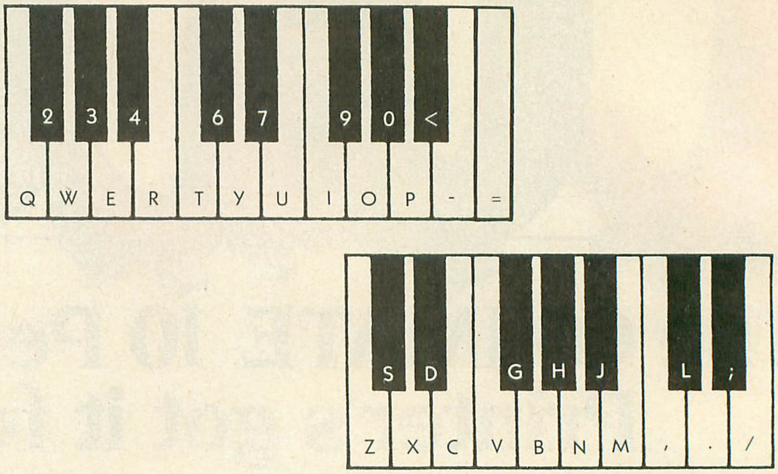
Your Atari starts counting with zero instead of one, so these numbers count from 0 on line 31000 to 63 on line 31006. Instead of using the usual GET statement to read the keyboard, I used the computer's internal codes. Every time you press one of the keys on the keyboard, the computer stores a number in memory location 764 (Please see *Figure 4*).

The numbers in the DATA statements correspond to the line numbers where that key's sound effect begins. So, if you made up a sound and put it on line 2000, you would have to decide what key you wanted it triggered from. You would then find that key on the Key Codes list and write down its number.

Suppose you want the sound to be assigned to the TAB key. The key number is 44, so you would put 2000 in the 44th number in the DATA statements. Since the DATA is arranged in ten-number lines and each line goes from 0 to 9, 44 would be on line 31004 and would be the fifth number in. (40 would be the first, 41 would be the second, etc.) *Figure 5* is a list of the line numbers and their corresponding hexadecimal numbers.

The numbers that are already there are the sounds that I have made up. I must admit the programming looks pretty messy. When I first wrote the program, I tried to make it as simple and organized as possible. But there's always room for artistic improvement, right? I kept going back and adding and removing until I was completely satisfied with the sounds. As a result, the coding looks like a jumble of POKEs and FOR-NEXTs.

Figure 7
**Bass Synth Keyboard**




One technique I discovered is the way to get the solid bass drum "thump." By using a distortion of 1 (POKE 53761,(16*1)+VOLUME), the computer doesn't make a continuing sound, but a "click." And when you put a bunch of the clicks together in a preset way, you're on your way to a realistic bass drum sound.

## AMPLIFY IT

Now to put some power in your drums. Hearing a synthesizer through a television set's puny speaker is not the best way, so hook your computer up to your stereo.

You can connect the monitor output of an Atari 800, 800XL or 1200XL to the auxiliary input of a stereo amplifier by using a cable that has a 5-pin DIN plug at one end and an RCA jack at the other. You'll find this kind of cable for a few dollars at just about any electronics store (If you only find cables with 2 RCA jacks at one end, those will work too.)

In case you prefer to make your own cable, *Figure 6* is the front view of the 5-pin DIN plug. Connect the cable's shielded wire to Ground and the center wire to Audio Output.

If you have a 400 or 600XL, you probably must be content with the TV speaker unless somebody out there knows how to reroute the sound without a monitor output. **DO NOT GO INTO YOUR TELEVISION!** This can cause intensive electric shock even when unplugged!

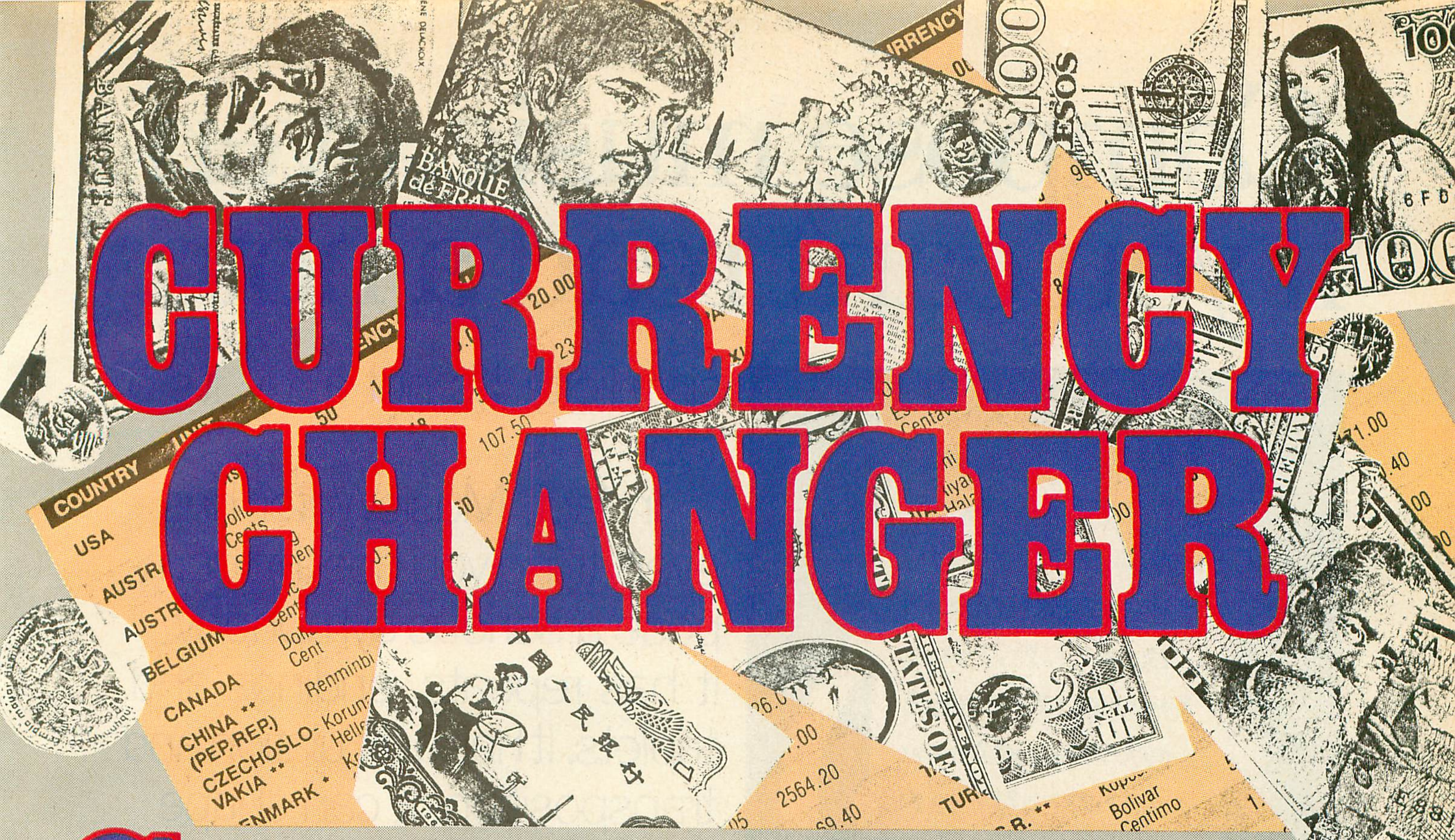
## BASS SYNTH

Listing 1, Bass Synth, is a bass synthesizer that's capable of some pretty astounding effects. This program can be typed in and operated just about the same way as Drum Synth.

*Figure 7* pictures a piano keyboard overlaid with the Atari keys that will get you each of the notes. Some people even think Bass Synth sounds more like a heavy metal guitar or a keyboard synthesizer. Anyway, have fun with your new musical instruments!

*Glen Gutierrez is a sixteen-year-old high school student in Fremont, California. He's had his Atari 800 for two years and he thinks of himself as a computer artist, rather than a computer programmer.*

Listing on page 47




# CURRENCY CHANGER

by JOHN GOOLEVITCH and WARWICK WAKEMAN

*Exchange international money like a seasoned traveler. Currency Changer is a BASIC program that runs on all Atari computers of any memory size.*

Converting Greek drachmas into Irish punts and then to Chinese renminbis is easy if you're an international banker—or if you have Currency Changer running on your Atari.

This easy-to-use BASIC program takes the confusion out of buying and selling foreign currency. So you'll be all set when you prepare for that trip to Europe, or mail a check for some exotic overseas merchandise.

Current exchange rates are listed daily in your local newspaper. Type in the numbers for the country or countries you are interested in. The program will compute the amount of one currency needed to buy a specified amount of another.

## HOW TO USE THE PROGRAM

Using TYPO II to check each line, type in Currency Changer and SAVE it. When you RUN the program, you'll first select a choice: convert home currency to foreign, foreign to home, or convert between two foreign exchange rates.

For instance, you might wish to change U.S. dollars to Tanzanian schillins. Choose option one, home to foreign conversion. At the prompts, input the names of the two countries. You'll be asked for the current exchange rate of the schillin, in terms of dollars per unit of foreign currency. If there are four schillins to the dollar, input .25—one quarter of a dollar equals one schillin.

Currency Changer includes 44 countries. If this is not enough, you could adjust the program lines beyond 2000. Let's say you're going to visit the Great Underground Empire. Change one of the countries in the data statements to GUE, and type in the name of the local currency, Frobozz. RUN the program again.

*John Goolevitch and Warwick Wakeman hail from British Columbia, Canada. John is an Atari programmer, and Wakeman is a regular international contributor to* ***Antic.***

## PROGRAM TAKE-APART

| Lines | |
|---|---|
| 10 | Dimensions string variables |
| 100–220 | Title page with graphic and sound routines |
| 230–330 | Information and instructions to user |
| 340–400 | Presents choices on how user wants calculations to be done |
| 410–420 | Sound routine |
| 440–520 | Sound routine |
| 525–660 | Subroutine to set up countries list |
| 670–800 | Requests input of countries |
| 810–900 | Requests input of exchange rates and currency amount |
| 910–1020 | Calculations routine and prints results |
| 1030–1170 | Asks if user wants different countries or new amounts |
| 1990–2080 | Data statements |

Listing on page 41.

# Compose music, even if you can't read a note.



With the Bank Street MusicWriter by Glen Clancy, you compose by computer.

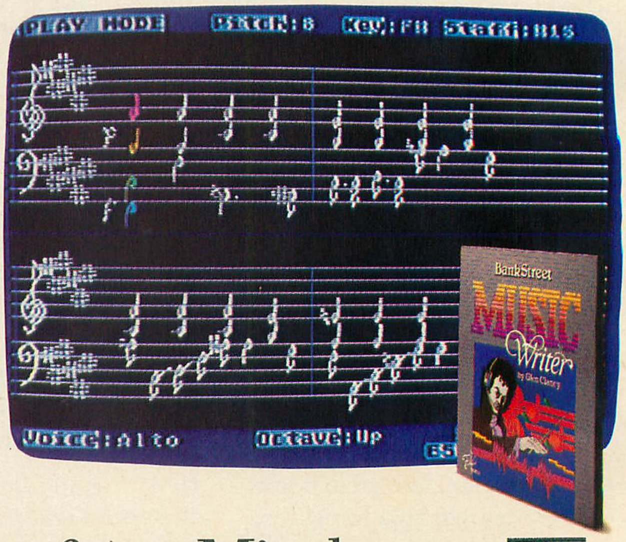
It's so simple, people who don't know a pianissimo from a pizza can start composing in less than an hour.

All you do is match the sound that you hear in your head. And the MusicWriter writes it down.

But don't be fooled by the simplicity. It's not a toy. It's a tool.

In fact, MusicWriter has everything you need to compose a serious symphony. It has repeats, endings and triplets. It has articulation and transposition. It can shape tones, store 75 staffs, and play up to 4 voices.

But even if you don't know what all that means, it won't stand in your way. Because if you can hum a tune, you can write a tune.




**Bank Street MusicWriter from Mindscape**

Compatible with Atari® and Commodore® Mindscape, Inc., 3444 Dundee Road, Northbrook, Illinois 60062.

For more information, call 1-800-221-9884. In Illinois, 1-800-942-7315.

*If you're one of those people who gets irritated by the keyclick on the Atari 400 and 800, this BASIC program turns off the sound without hardware modifications.*

"Is there a way to disable the Atari keyboard speaker with a POKE statement instead of disconnecting the wires?"
Chris Cataldo of Chesapeake, Virginia wrote to **Antic.**

"I would like to know if there is a command to shut off the clicking of the 800 keyboard?"
wrote Travis Appleman of Georgetown, Kentucky.

# BEAT THE BEEPS

## Turning off keyboard sound

by IAN LOVEJOY

The I/O Board gets asked about that fairly often, which is why we're especially happy to publish this program for silencing the keyboard.

Of course, if you own an XL model, you don't need the program. Simply lower the volume on your TV. However, if you prefer to turn off the sound at its source, POKE 731,255 to turn the sound off, and POKE 731,0 to turn it on again.

Beat the Beeps is a BASIC program that creates a binary file to turn off the clicks. Type in the listing, check it with TYPO II, SAVE a copy, and RUN it. (Note that RESET deactivates the program, but X=USR(1536) reactivates it.)

### HOW IT WORKS

The Atari is largely controlled by small subprograms called handlers. Five "resident" handlers are always present. They control the printer (P:), the cassette (C:), the display or screen editor (E:), the screen (S:) and the keyboard (K:). When you turn on your computer with the disk drive turned on and a disk in, you load in the disk handler (D:). This is why you must specify the D: when you save or load a file from the disk

Existing handlers can be modified or replaced by your own handlers.

Part of the keyboard handler tells the computer to produce a click sound with the built-in speaker in the 400 or 800. Beat The Beeps replaces the existing keyboard handler with a clickless handler.

A 38-byte handler table is in memory from locations 794 to 831. It's called HATABS (Handler Address TABleS). Up to 12 different handler addresses can be placed in HATABS. Each entry takes up 3 bytes. The first byte holds the character code by which the handler is called. This is 68 "D" for the disk, 75 "K" for the keyboard, etc. Try this:

```
POKE 809,81
```

This changes the "D:" device name for the disk to a "Q:". You can save and load programs from the disk using the device name "Q:".

Bytes 2 and 3 of each entry hold the address of another table telling the computer where to go to carry out each function a handler can perform. These functions include OPEN, CLOSE, GET BYTE, PUT BYTE, GET STATUS and a SPECIAL function. The SPECIAL funtion is used for such things as formatting a disk (with the D: handler) or drawing a line (with the S: handler.) Each function entry contains the 2-byte address of the program to execute the desired function.

Beat the Beeps changes the keyboard HATABS entry so that it points to its own function table, which in turn points to the modified keyboard handler itself. Voila! The click is gone!

*Ian Lovejoy is a machine language programmer from San Francisco, California.*

Listing on page 49

# SOFTWARE LIBRARY

**Antic** type-in listing section includes every full-length program from this issue. Listings are easier to type and proofread, easy to remove and save in a binder if you wish.



***DISK SUBSCRIBERS:*** You can use all these programs immediately. Just RUN the correct filenames shown at the start of each accompanying magazine article.


**Antic** Listing Credits: Gemini 10X Printer—$399 from Star Micronics, Inc., 200 Park Avenue, New York, N.Y. 10166. Lister Plus Software—$19.95 from Non-Standard Magic, P.O. Box 45, Girard, Ohio, 44420. (48K disk)

# TYPING SPECIAL ATARI CHARACTERS

Shown below are the Atari Special Characters as printed in **Antic** listings—and the keys you must type in order to get them. Boxes are drawn around the normal video characters here so you can see their positions more accurately, these boxes do not appear in the printed listings.

Whenever the CTRL key (CONTROL on XL models) or SHIFT key is used, *hold it down* while you press the next keys. Whenever the ESC key is used, *press and release* it before typing the next keys.

Turn on inverse video by pressing the Atari logo key once. Turn it off by pressing a second time. (XL models use the Reverse Video Mode Key instead.)

Sometimes it's not easy to tell apart the following characters, shown here in both normal and inverse video. Be especially careful when you type any of these:

| | | | |
|---|---|---|---|
| | CTRL F | | / |
| | CTRL G | | SHIFT + |
| | CTRL N | | SHIFT - |
| | CTRL R | | - |
| | CTRL S | | + |

## NORMAL VIDEO

| FOR THIS | TYPE THIS | FOR THIS | TYPE THIS |
|---|---|---|---|
| | CTRL , | | CTRL T |
| | CTRL A | | CTRL U |
| | CTRL B | | CTRL V |
| | CTRL C | | CTRL W |
| | CTRL D | | CTRL X |
| | CTRL E | | CTRL Y |
| | CTRL F | | CTRL Z |
| | CTRL G | | ESC ESC |
| | CTRL H | | ESC CTRL - |
| | CTRL I | | ESC CTRL = |
| | CTRL J | | ESC CTRL + |
| | CTRL K | | ESC CTRL * |
| | CTRL L | | CTRL . |
| | CTRL M | | CTRL ; |
| | CTRL N | | SHIFT = |
| | CTRL O | | ESC SHIFT CLEAR |
| | CTRL P | | |
| | CTRL Q | | |
| | CTRL R | | ESC DELETE |
| | CTRL S | | ESC TAB |

## INVERSE VIDEO

| FOR THIS | TYPE THIS | FOR THIS | TYPE THIS |
|---|---|---|---|
| | 人CTRL , | | 人CTRL Y |
| | 人CTRL A | | 人CTRL Z |
| | 人CTRL B | | ESC SHIFT DELETE |
| | 人CTRL C | | |
| | 人CTRL D | | |
| | 人CTRL E | | ESC SHIFT INSERT |
| | 人CTRL F | | |
| | 人CTRL G | | |
| | 人CTRL H | | ESC CTRL TAB |
| | 人CTRL I | | |
| | 人CTRL J | | |
| | 人CTRL K | | ESC SHIFT TAB |
| | 人CTRL L | | |
| | 人CTRL M | | |
| | 人CTRL N | | 人CTRL . |
| | 人CTRL O | | 人CTRL ; |
| | 人CTRL P | | 人SHIFT = |
| | 人CTRL Q | | ESC CTRL 2 |
| | 人CTRL R | | ESC CTRL DELETE |
| | 人CTRL S | | |
| | 人CTRL T | | |
| | 人CTRL U | | ESC CTRL INSERT |
| | 人CTRL V | | |
| | 人CTRL W | | |
| | 人CTRL X | | |

# HOW TO USE TYPO II

Type in TYPO II and SAVE a copy to disk or cassette.

Type GOTO 32000 and follow TYPO II onscreen instructions. If the resulting two-letter line codes are not exactly the same as those in the magazine, you mistyped something in that line.

To call back any line previously typed, type an asterisk [*] followed (without in-between spaces) by the line number, then press [RETURN]. This is also the way you use TYPO II to proofread itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000.

To remove TYPO II from your program, type LIST "D:FILENAME",0,31999 (Cassette owners LIST "C:). Type NEW, then ENTER "D:FILENAME" (Cassette—ENTER "C:). Your program is now in memory without TYPO II and you can SAVE or LIST it to disk or cassette.

BASIC XL cartridge owners type SET 5,0 and SET 12,0 before using TYPO II.

```
WB 32000 REM TYPO II BY ANDY BARTON
VM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLR :DIM LINE$(120):CLOSE #2:CLO
   SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "↖":POSITION 11,1:? " TYPO II "
EM 32050 TRAP 32040:POSITION 2,3:? "Type
   in a program line"
HS 32060 POSITION 1,4:? " ":INPUT #2;LINE
   $:IF LINE$="" THEN POSITION 2,4:LIST B
   :GOTO 32060
XH 32070 IF LINE$(1,1)="*" THEN B=VAL(LIN
   E$(2,LEN(LINE$))):POSITION 2,4:LIST B:
   GOTO 32060
TH 32080 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINE$):POSITION 1,3:? " ";
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
ET 32120 ? "↖":POSITION 11,1:? " TYPO II 
   ":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3;LINE$:IF
   LINE$="" THEN ? "LINE ";B;" DELETED":G
   OTO 32050
VV 32150 FOR D=1 TO LEN(LINE$):C=C+1:ANS=
   ANS+(C*ASC(LINE$(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE);CHR$
   (LCODE)
VG 32220 POSITION 2,13:? "If CODE does no
   t match press  RETURN  and edit line a
   bove.":GOTO 32050
```

# ERROR FILE

### MISSING INFOBITS
December '84

The AL source listing for Infobits (Dec. '84) was left out of the previous issue. You'll find it in the Jan.'85 Software Library.

### ADVENT X-5
November '84

Add the following line: 8020 RUN. If the program locks up, you may be mistyping line 1005, for which the TYPO II code is EJ.

### LITTLE BROTHER INSTALLED PROPERLY
April '84

The schematic on page 106 shows resistor R11 to have a value of 2.2 Ohms. This should be 2.2 kilo Ohms.

### OCTOBER OMISSIONS October '84

A number of division signs [/] were omitted at the printer. On the magazine pages there is an empty space where they should have appeared. For specific corrections, see the December '84 or January '85 error file.

### ANTIC 4/5 EDITOR
October '84

To get this to run on XL machines, change both 36's in the lines 52 to 35, and change the 39 in line 522 to 38.

### RECALL
August '84

To get this program to run, you must first LIST it to disk or cassette, type NEW then type:DIM QQ$(1). After this, ENTER the program and it should run. SAVE this version which will run from then on without the preliminaries.

### CREEPY CAVERNS
August '84

In line 10, change MO(N,5) to MO(P,5). In line 349, there is a YO(Y-ZERO) that should be YO (Y-O). The first change will prevent an error 3 and the second an error 9.

### AMODEM
July '84

There is an error in the instructions of the R-Receive procedure (and others that mention filenames), do not include quotes when typing in a filename during the run of the program.

### EXPLORING THE XL
June '84

There was a misprinted inverse video zero. In line 230, what appears as inverse "Or" should instead read "0r", replacing the capital letter with a zero.

APX 1983 prize-winner now in antic

# HOME LOAN ANALYZER

Article on page 18.

```
ZX 10 REM <<<      HOME LOAN      >>>
JR 20 REM <<<       ANALYSIS      >>>
BO 30 REM <<<   COPYRIGHT 1982    >>>
ED 40 REM <<<   J. F. SKINNER     >>>
XL 50 REM <<<     VERSION 1.1     >>>
RF 60 REM <<< FOR ANTIC MAGAZINE >>>
LZ 70 GOTO 3350
SJ 80 REM INPUT ROUTINE
LU 82 IF M=13 THEN GOTO 1180
MG 84 IF M=19 THEN GOTO 2330
UJ 90 TRAP 3460:OPEN #1,4,0,"K:":LNS=1:PO
   SITION 28,M:? "1             ":POKE 752,0
   :POSITION 28,M:I$="1"
XP 100 GET #1,E:POKE 694,0
EY 110 IF E=155 THEN POKE 764,255:POKE 75
   2,1:CLOSE #1:GOTO 290
MP 120 IF E=126 AND LNS>1 THEN LNS=LNS-1:
   I$(LNS)=" ":PRINT CHR$(E);
PH 130 IF LNS>LN THEN 100
EG 140 IF E<46 OR E=47 OR E>57 THEN 100
VW 150 I$(LNS,LNS)=CHR$(E):? CHR$(E);:LNS
   =LNS+1
LS 160 GOTO 100
EP 170 REM MOVE CURSOR
MP 180 A=PEEK(53279):B=STRIG(0):C=PEEK(63
   2):D=PEEK(764)
RL 190 IF A=6 OR B=0 THEN GOTO 320
JO 200 IF D<>255 THEN LN=T(M):GOTO 80
ZS 210 POSITION 26,M:? "  "
ZJ 220 IF A=5 OR C=13 THEN M=M+1
BN 230 IF A=3 OR C=14 THEN M=M-1
RM 240 IF M>19 THEN M=4
OD 250 IF M<4 THEN M=19
ZE 260 POSITION 26,M:? "=>"
ON 270 FOR Y=1 TO 45:NEXT Y
OW 280 GOTO 170
MR 290 ON M GOTO 170,170,170,1670,2000,17
   20,2050,1780,2090,1890,1830,1950,1180,
   2130,2180,2230,2280,2380,2330
UY 300 POKE 764,255:GOTO 170
RM 310 REM CALCULATE
RW 320 IF M=19 THEN GOTO 2330
WT 330 IF M=18 THEN GOSUB 2920:GOSUB 2430
   :GOSUB 2760:GOTO 170
FG 340 IF M=4 THEN GOSUB 2920:GOSUB 2590:
   GOTO 170
FS 350 GOSUB 2920:GOSUB 2430:GOSUB 2690
RS 360 IF M=13 THEN GOTO 1180
OV 370 GOTO 170
OI 380 RETURN :REM POKE 77,0: POKE 580,1:
   ZZZ=PEEK(16):IF PEEK(16)>128 THEN POKE
    16,ZZZ-128:POKE 53774,ZZZ-128
ZG 390 POKE 764,255:POKE 702,64:POKE 694,
   0:RETURN
BU 400 SOUND 1,55,10,5:FOR TI=1 TO 75:NEX
   T TI:SOUND 1,0,0,0:RETURN :REM KSND
AT 410 SETCOLOR 4,4,6:SOUND 1,100,12,5
OZ 420 FOR TI=1 TO 100:NEXT TI:SOUND 1,0,
   0,0:FOR TI=1 TO 500:NEXT TI:SETCOLOR 4
   ,0,12:RETURN :REM BSND
CF 430 SOUND 1,100,100,100:FOR TI=1 TO 75
   :NEXT TI:SOUND 1,0,0,0:RETURN :REM GSN
   D
TA 440 REM PRINT SCREEN
CI 450 MM=0
TG 460 IF LINECNT>=17 THEN GOTO 490
FX 470 LINECNT=LINECNT+1
QX 480 GOTO 580
AL 490 LINECNT=6
HB 500 GRAPHICS 0:POKE 752,1:GOSUB 380
UX 510 SETCOLOR 1,14,12:SETCOLOR 2,10,5:S
   ETCOLOR 4,0,12
OZ 520 ? "           AMORTIZATION SCHEDULE"
XU 530 ? ,"     $";PA$;" Month"
YM 540 ? "       ";SYEARS;" YEARS      ";SFFI
   NT;"%";"       $";ABAL
QB 550 ? DASH$
CZ 560 ? " DATE","PRIN","INT","BAL"
QF 570 ? DASH$
AL 580 REM PRINT SCREEN LINE
GU 590 II$=STR$(II):IF LEN(II$)=1 THEN II
   $(1,1)=" ":II$(2,2)=STR$(II)
NL 600 TRAP 640
FH 610 X$=STR$(FINT):IF X$(LEN(X$)-1,LEN(
   X$)-1)="." THEN X$(LEN(X$)+1)="0"
UH 620 IF X$(LEN(X$)-2,LEN(X$)-2)<>"." TH
   EN X$(LEN(X$)+1)=".00"
RP 630 GOTO 645
BD 640 X$(LEN(X$)+1)=".00"
RM 645 TRAP 665
QN 650 TRAP 664
SS 652 P$=STR$(FESS):IF P$(LEN(P$)-1,LEN(
   P$)-1)="." THEN P$(LEN(P$)+1)="0"
DV 660 IF P$(LEN(P$)-2,LEN(P$)-2)<>"." TH
   EN P$(LEN(P$)+1)=".00"
RA 662 GOTO 670
WN 664 P$(LEN(P$)+1)=".00"
WQ 665 P$(LEN(P$)+1)=".00"
GD 670 IF BAL=0 THEN B$="0.00":GOTO 700
SZ 675 TRAP 695
TS 680 B$=STR$(BAL):IF B$(LEN(B$)-1,LEN(B
   $)-1)="." THEN B$(LEN(B$)+1)="0"
HF 690 IF B$(LEN(B$)-2,LEN(B$)-2)<>"." TH
   EN B$(LEN(B$)+1)=".00"
OR 692 GOTO 700
NS 695 B$(LEN(B$)+1)=".00"
UR 700 POSITION 1,LINECNT:? II$;"-";JJ;:P
   OSITION 10,LINECNT:? P$;
XF 705 POSITION 19,LINECNT:? X$;:POSITION
    28,LINECNT:? B$;
XM 710 IF LINECNT>=17 THEN GOSUB 730
ZH 720 RETURN
RR 730 TRAP 775
WV 740 POKE 764,255
DK 750 ? " ":? DASH$
WU 760 TP$=STR$(TOTP):IF TP$(LEN(TP$)-1,L
   EN(TP$)-1)="." THEN TP$(LEN(TP$)+1)="0
   "
OE 770 IF TP$(LEN(TP$)-2,LEN(TP$)-2)<>"."
    THEN TP$(LEN(TP$)+1)=".00"
UT 772 GOTO 777
KE 775 TP$(LEN(TP$)+1)=".00"
TQ 777 TRAP 795
HQ 780 TI$=STR$(TOTI):IF TI$(LEN(TI$)-1,L
   EN(TI$)-1)="." THEN TI$(LEN(TI$)+1)="0
   "
YW 790 IF TI$(LEN(TI$)-2,LEN(TI$)-2)<>"."
    THEN TI$(LEN(TI$)+1)=".00"
VT 792 GOTO 797
EY 795 TI$(LEN(TI$)+1)=".00"
KJ 797 TRAP 40000
QT 800 POSITION 1,19:? "TOTAL":POSITION 8
   ,19:? TP$:POSITION 19,19:? TI$
KK 810 ? "┌──────────────────────────────────
   ───────────┐ ";
FK 820 ? BORDR$;
FM 830 ? BORDR$;
BT 840 ? "└──────────────────────────────────
   ───────────┘";
```

```
SM 850 POSITION 2,21:? " P=print RETURN=g
   o to the next year";
AR 860 POSITION 2,22:? "    START=return t
   o the MAIN MENU    ";
QK 870 IF BAL=0 THEN POSITION 11,21:? " T
   his is the last year.       ";
DR 880 POKE 764,255:POKE 53279,7
QX 890 A=PEEK(53279):B=STRIG(0):D=PEEK(76
   4)
GZ 900 IF A=6 THEN POP :GOSUB GSND:GOTO 3
   080
QY 910 IF B=0 THEN GOTO 940
OY 920 IF D=10 THEN GOSUB GSND:TRAP 3300:
   P=0:Q=20:GOSUB 960:GOTO 800
HH 930 IF D<>12 THEN GOTO 890
FV 940 IF JJ>=FINISH THEN POP :GOSUB GSND
   :GOTO 3080
ZP 950 RETURN
PQ 960 REM COPY SCREEN TO PRINTER
JU 970 POKE 764,255:D=255:A=7
MC 980 POSITION 2,21:? " Position Paper a
   nd press SPACE-BAR ";
CW 990 POSITION 2,22:? " (Press OPTION to
    Exit Print Mode)  ";
KG 1000 D=PEEK(764):A=PEEK(53279)
RS 1010 IF D=33 THEN POKE 764,255:D=255:G
   OTO 1040
BF 1020 IF A=3 THEN POKE 53279,7:A=7:GOTO
    1160
MX 1030 GOTO 1000
GD 1040 POKE 764,255
CM 1050 POSITION 2,21:? "
                                  ";
NI 1060 IF MM=1 THEN LPRINT "          HOME
   LOAN ANALYSIS"
LQ 1070 FOR Y=P TO Q
QF 1080 FOR X=1 TO 38
SE 1090 POSITION X,Y
GI 1100 GET #5,G
YM 1110 LINEPRINT$(X+1,X+1)=CHR$(G)
LG 1120 NEXT X
RM 1130 A=PEEK(53279):IF A=3 THEN POKE 53
   279,7:POP :GOTO 1160
EP 1140 LPRINT LINEPRINT$
MA 1150 NEXT Y
GL 1160 POKE 764,255
AW 1170 RETURN
DO 1180 REM SCREEN OUTPUT
GR 1190 BEGIN=SJJ:FINISH=SJJ+SYEARS+2
NC 1200 POKE 752,0:POKE 764,255
KD 1210 IF SELECT<SJJ THEN SELECT=SJJ
QC 1220 TRAP 3080
HR 1230 POKE 201,9:LINECNT=20:GOSUB 380
BB 1240 GOSUB 2430
LF 1250 FFINT=SFFINT:YEARS=SYEARS:II=SII:
   JJ=SJJ
ZG 1260 POSITION 3,21:? "          CALCULA
   TING                ";:POSITION 24,21:?
    JJ;
HU 1270 POSITION 2,22:? " (Press OPTION t
   o Exit Calculation) ";
UA 1280 II=II-1
PX 1290 FOR I=1 TO YEARS+1
ER 1300 FOR J=1 TO 12
SL 1310 II=II+1
MT 1320 IF II<13 THEN GOTO 1340
SU 1330 II=1:JJ=JJ+1
RQ 1340 FINT=R*BAL
KU 1350 FINT=INT((FINT+5.0E-03)*100)/100
FS 1360 FINT=FINT*100:FINT=INT(FINT):FINT
   =FINT/100
DG 1370 FESS=PAY-FINT:TOTP=TOTP+FESS:TOTI
   =TOTI+FINT
OS 1380 KEY1=PEEK(53279):IF KEY1<6 THEN P
   OP :KEY1=7:GOTO 3080
HE 1390 IF FESS>=BAL THEN GOTO 1450
QJ 1400 BAL=BAL-FESS:POKE 752,1
NN 1410 IF JJ<SELECT THEN POSITION 3,21:?
    "        CALCULATING ";JJ;"
   ";:SOUND 1,5,10,5:SOUND 1,0,0,0
LN 1420 IF JJ>=SELECT AND JJ<=FINISH THEN
    GOSUB 440
FR 1430 NEXT J
FJ 1440 NEXT I
OK 1450 ADJ=FESS-BAL:FESS=BAL:BAL=0:TOTP=
   TOTP-ADJ
UW 1460 GOSUB 440:IF LINECNT<17 THEN GOSU
   B 730
JL 1470 POSITION 1,20:? "LAST PAYMENT    "
   ;FESS+FINT;
LG 1480 IF BAMT>0 THEN ? " + ";BAMT;" BAL
   LOON";
ST 1490 GOTO 3080
AJ 1500 RETURN
VD 1510 REM START
HE 1520 GRAPHICS 2+16:GOSUB 380
ZR 1530 SETCOLOR 0,9,4:SETCOLOR 1,13,4
EO 1540 SETCOLOR 2,4,6:SETCOLOR 3,0,0
JP 1550 SETCOLOR 4,12,12
WH 1560 PRINT #6:PRINT #6
QS 1570 PRINT #6;"         HOME  "
SN 1575 PRINT #6;"         LOAN  "
HV 1580 PRINT #6;"       ANALYSIS":PRINT #
   6
UD 1590 PRINT #6;"    COPYRIGHT 1982 "
ME 1600 PRINT #6;"    BY JIM SKINNER "
WG 1610 PRINT #6
EJ 1620 PRINT #6;"       press start   "
GM 1630 COLOR 4:PLOT 0,0:DRAWTO 0,11:DRAW
   TO 19,11:DRAWTO 19,0:DRAWTO 0,0
EE 1640 IF PEEK(53279)<>6 THEN GOTO 1640
GI 1650 TRAP 4:POKE 764,255
SO 1660 GOTO 3080
MS 1670 REM ENTER PURCHASE PRICE
EV 1710 SBAL=VAL(I$):GOTO 3250
DX 1720 REM ENTER INTEREST RATE
LC 1750 IF I$>"50" THEN GOTO 3460
EF 1755 SFFINT=VAL(I$):I$=""
CU 1760 R=SFFINT/1200:BCALC=1
SE 1770 GOTO 3250
QJ 1780 REM ENTER LENGTH
ES 1810 SYEARS=VAL(I$):BCALC=1
RR 1820 GOTO 3250
PV 1830 REM ENTER FIRST MONTH
XI 1860 SII=VAL(I$)
GG 1870 IF SII<1 OR SII>12 THEN SII=1
SJ 1880 GOTO 3250
JX 1890 REM ENTER FIRST YEAR
XN 1920 SJJ=VAL(I$)
RW 1930 GOTO 3250
ZI 1950 REM ENTER AMORTIZATION YEAR
HV 1980 SELECT=VAL(I$)
SO 1990 GOTO 3250
OT 2000 REM ENTER DOWN PAYMENT
XU 2030 DPMT=VAL(I$):IF SBAL<DPMT THEN GO
   TO 3460
RI 2040 GOTO 3250
SR 2050 REM ENTER BALLOON PAYMENT
OZ 2080 BAMT=VAL(I$):BCALC=1:GOTO 3250
RU 2090 REM ENTER MONTHLY PAYMENT
QH 2120 MPMT=VAL(I$):PA$=I$:GOSUB 2920:GO
   SUB 2590:GOTO 3250
VZ 2130 REM ENTER APPRAISED VALUE
MK 2160 AVAL=VAL(I$)
RT 2170 GOTO 3250
BR 2180 REM <<<ENTER APPRAISED YEAR>>>
IB 2210 AYEAR=VAL(I$)
RG 2220 GOTO 3250
XP 2230 REM ENTER RATE OF APPRECIATION
ZV 2260 ARATE=VAL(I$):GOSUB 2760
RV 2270 GOTO 3250
NC 2280 REM ENTER RESALE VALUE
ND 2310 FVAL=VAL(I$)
RI 2320 GOTO 3250
WP 2330 REM SELECT PRINT SCREEN
KB 2340 TRAP 3300:P=4:Q=18:MM=1
```

continued on next page

```
CF 2350 GOSUB 960
VN 2360 MM=0
RX 2370 GOTO 3250
MH 2380 REM ENTER RESALE YEAR
JJ 2410 FYEAR=VAL(I$)
RK 2420 GOTO 3250
VQ 2430 REM CALC MONTHLY PAYMENT
RK 2440 TRAP 2560
LK 2450 BAL=(SBAL-DPMT)-PVBAMT:R=SFFINT/1
   200
LK 2460 ABAL=BAL:FINISH=SYEARS+SJJ
HI 2470 IF BAMT=0 THEN PAY=(1+R)^(SYEARS*
   12):GOTO 2490
UF 2480 PAY=(1+R)^((SYEARS*12)-1)
YG 2490 PAY=R*PAY*BAL/(PAY-1)
UB 2492 TRAP 2527
YC 2500 PAY=INT((PAY+5.0E-03)*100)/100
PG 2510 PA$=STR$(PAY):IF PA$(LEN(PA$)-1,L
   EN(PA$)-1)="." THEN PA$(LEN(PA$)+1)="0
   "
NX 2520 IF PA$(LEN(PA$)-2,LEN(PA$)-2)<>".
   " THEN PA$(LEN(PA$)+1)=".00"
WA 2525 GOTO 2528
VO 2527 PA$(LEN(PA$)+1)=".00"
PS 2528 TRAP 40000
UM 2530 POSITION 28,9:? "          "
CQ 2540 POSITION 28,9:? PA$
AZ 2550 RETURN
AK 2560 TRAP 3460:IF PEEK(195)=11 THEN GO
   TO 3460
VB 2570 PA$(LEN(PA$)+1)=".00"
SD 2580 GOTO 2530
LU 2590 REM CALCULATE PURCHASE PRICE
FB 2600 R=SFFINT/1200
ZA 2610 IF BAMT=0 THEN PAY=(1+R)^(SYEARS*
   12):GOTO 2630
TR 2620 PAY=(1+R)^((SYEARS*12)-1)
BK 2630 BAL=(MPMT*(PAY-1))/(R*PAY)
RJ 2640 BAL=INT(BAL+0.5)
ON 2650 SBAL=BAL+PVBAMT+DPMT
QP 2660 POSITION 28,4:? "          ";
FW 2670 POSITION 28,4:? SBAL;
BK 2680 RETURN
SE 2690 REM CALC APPRECIATION RATE
NT 2700 ARATE=(FVAL-AVAL)/(FYEAR-AYEAR)
SH 2710 ARATE=(ARATE/AVAL)*100
UL 2720 ARATE=INT((ARATE+5.0E-03)*100)/10
   0
YU 2730 POSITION 28,16:? "          ";
NB 2740 POSITION 28,16:? ARATE;
BD 2750 RETURN
TR 2760 REM CALC FUTURE RE VALUE
AG 2770 FVAL=AVAL:IF FYEAR=AYEAR THEN GOT
   O 2890
FV 2780 IF FVAL=0 THEN GOTO 2890
TK 2790 IF FYEAR<AYEAR THEN GOTO 2850
MJ 2800 FOR X=1 TO (FYEAR-AYEAR)
DL 2810 FVAL=FVAL+(FVAL*(ARATE/100))
PL 2820 FVAL=INT(FVAL)
LY 2830 NEXT X
WH 2840 GOTO 2890
OC 2850 FOR X=1 TO (AYEAR-FYEAR)
FE 2860 FVAL=FVAL-(FVAL*(ARATE/100))
OA 2870 FVAL=INT(FVAL)
MN 2880 NEXT X
AH 2890 POSITION 28,17:? "          ";
RR 2900 POSITION 28,17:? FVAL;
AV 2910 RETURN
CG 2920 REM CALCULATE PV OF BALLOON
BM 2930 POKE 752,1:POKE 53279,7:IF BAMT=0
    THEN PVBAMT=0:GOTO 3050
FZ 2940 IF BCALC=0 THEN GOTO 3050
DZ 2950 POSITION 3,21:? "   Calculating P
   resent Value        ";
BC 2960 POSITION 3,22:? "      of Balloon
    Payment            ";
EB 2970 PVBAMT=BAMT
BS 2980 FOR X=1 TO (SYEARS*12):SOUND 1,5,
   10,5:SOUND 1,0,0,0
JS 2990 POSITION 27,22:? ((SYEARS*12)-X);
   "  ";
ZS 3000 A=PEEK(53279)
WI 3010 PVBAMT=(PVBAMT-(PVBAMT*R))
LD 3020 IF PVBAMT<0 OR A=3 THEN PVBAMT=0:
   POP :GOTO 3040
AP 3030 NEXT X:BCALC=0
XV 3040 PVBAMT=INT((PVBAMT+5.0E-03)*100)/
   100
LC 3050 POSITION 3,21:? "OPTION=up SELECT
   =down START=compute";
PA 3060 POSITION 3,22:? "Type a number an
   d then press RETURN";
AW 3070 RETURN
QX 3080 REM FORMAT AT SCREEN
YI 3090 TOTP=0:TOTI=0:MM=1
TJ 3100 POKE 82,1:POKE 83,39:GRAPHICS 0:G
   OSUB 380
NU 3110 POKE 752,1:POKE 764,255
OI 3120 SETCOLOR 1,14,12:SETCOLOR 2,10,5:
   SETCOLOR 4,0,12
CS 3130 ? "┌──────────────────────────────
   ──────┐";
KA 3140 ? BORDR$;
KD 3150 ? BORDR$;
TF 3160 ? "└──────────────────────────────
   ──────┘";
LH 3170 POSITION 6,1:? "      HOME LOAN AN
   ALYSIS"
GA 3180 POSITION 6,2:? "  (c) 1982 by Jim
    Skinner"
CP 3190 GOSUB 3530
CP 3200 POSITION 1,20
CO 3210 ? "┌──────────────────────────────
   ──────┐";
JW 3220 ? BORDR$;
JZ 3230 ? BORDR$;
TB 3240 ? "└──────────────────────────────
   ──────┘";
CJ 3250 GOSUB KSND
PH 3260 POKE 752,1
LM 3270 POSITION 3,21:? "OPTION=up SELECT
   =down START=compute";
PK 3280 POSITION 3,22:? "Type a number an
   d then press RETURN";
RF 3290 GOTO 170
MP 3300 REM PRINTER OFF LINE
MQ 3310 POSITION 2,22:? "    Please turn
   your printer on.    ";:GOSUB BSND
GF 3320 POKE 764,255
KR 3330 IF MM=1 THEN GOTO 3080
ST 3340 GOTO 850
YQ 3350 REM INITIALIZE
MY 3360 CLR :POKE 65,1:POKE 764,255
NI 3370 OPEN #5,4,0,"S:"
WF 3380 SETCOLOR 1,0,0:SETCOLOR 2,0,0
DC 3390 KSND=400:BSND=410:GSND=430
MU 3400 DIM I$(10),II$(2),Y(3),LINEPRINT$
   (40),X$(13),P$(13),B$(13),PA$(13),TP$(
   13),TI$(13)
LC 3410 SBAL=55000:DPMT=5000:SFFINT=12.5:
   SYEARS=30:SII=1:SJJ=1980:KEY=255:KEY1=
   7:LN=7:AYEAR=1980:FYEAR=1990
QG 3420 BEGIN=1980:FINISH=SJJ+SYEARS:SELE
   CT=1985:TOTP=0:TOTI=0:AVAL=55000:FVAL=
   90000:M=4:MPMT=533.63
FI 3425 DIM BORDR$(39),RETRN$(35),DASH$(3
   8),T(19)
VK 3430 LINEPRINT$(1)=" ":LINEPRINT$(40)=
   " ":LINEPRINT$(2)=LINEPRINT$
GF 3432 BORDR$="|
       | "
GV 3434 RETRN$="        then press RETURN
       "
PT 3436 DASH$="--------------------------
   -------------"
XD 3440 GOSUB 380:GOSUB 3710:GOSUB 2690:G
   OSUB 2430
QI 3450 GOTO 1510
```

```
DW 3460 REM INPUT ERROR
LG 3470 I$="0":POP
JM 3480 POSITION 3,21:? "  I couldn't rea
   d the last number  ";
DP 3490 POSITION 3,22:? "  you typed...
   Please try again.  ";
MV 3500 CLOSE #1
LE 3510 GOSUB BSND:TRAP 40000
SC 3520 GOTO 3080
ZS 3530 REM MAIN SCREEN
JC 3540 POSITION 3,4:? "Purchase Price...
   ......  ";SBAL
SQ 3550 POSITION 3,5:? "Down Payment.....
   ......  ";DPMT
HP 3560 POSITION 3,6:? "Interest  Rate...
   ......  ";SFFINT
AT 3570 POSITION 3,7:? "Balloon Payment..
   ......  ";BAMT
QY 3580 POSITION 3,8:? "Length of Loan in
    Years  ";SYEARS
VF 3590 POSITION 3,9:? "Monthly Payment..
   ......  ";PA$
ZO 3600 POSITION 3,10:? "Year  of First P
   ayment.  ";SJJ
GH 3610 POSITION 3,11:? "Month of First P
   ayment.  ";SII
HZ 3620 POSITION 3,12:? "Amortization Yea
   r......  ";SELECT
MH 3630 POSITION 3,13:? "Calculate  Amort
   ization  Schedule "
RL 3640 POSITION 3,14:? "Appraised Value.
   .......  ";AVAL
NV 3650 POSITION 3,15:? "Appraised Year..
   .......  ";AYEAR
TB 3660 POSITION 3,16:? "Appreciation rat
   e......  ";ARATE
ZZ 3670 POSITION 3,17:? "Resale Value....
   .......  ";FVAL
DN 3680 POSITION 3,18:? "Resale Year.....
   .......  ";FYEAR
XE 3690 POSITION 3,19:? "Print  This Info
   rmation  Print"
AP 3700 RETURN
YR 3710 RESTORE :FOR X=1 TO 19:READ F:T(X
   )=F:NEXT X:RETURN
AZ 3720 DATA 1,1,1,7,7,5,7,2,6,4,2,4,1,7,
   4,5,7,4,1
```

convert your drachmas to pesos

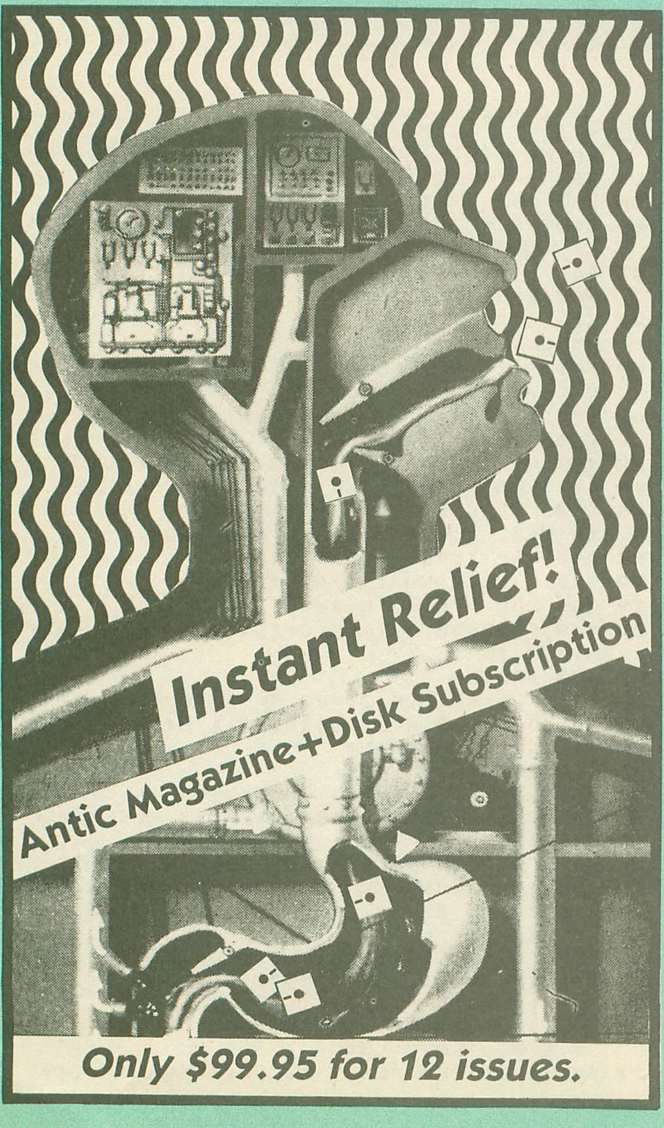
# CURRENCY CHANGER

Article on page 31.

```
LQ 5 REM CURRENCY CAPERS
TG 6 REM BY JOHN W. GOOLEVITCH
QO 7 REM ANTIC MAGAZINE
LH 10 DIM PLACE1$(15),PLACE2$(15),CUR1$(8
   ),CUR2$(8)
YN 100 GRAPHICS 17
BM 110 POSITION 2,3:? #6;"CURRENT"
BE 120 POSITION 5,6:? #6;"FOREIGN"
AE 130 POSITION 8,9:? #6;"EXCHANGE"
ST 140 POSITION 11,12:? #6;"PROGRAM"
QY 150 POSITION 6,14:? #6;"by"
EZ 160 POSITION 1,18:? #6;"john w. goolev
   itch"
RQ 170 POSITION 3,22:? #6;"PRESS ANY KEY
   "
OH 180 SETCOLOR 2,4,6:SETCOLOR 0,10,6:GOS
   UB 200
PU 190 SETCOLOR 0,4,6:SETCOLOR 2,10,6:GOS
   UB 200:GOTO 180
GD 200 R=INT(RND(0)*150)+75:FOR V=13 TO 1
    STEP -2:SOUND 0,R,10,V:NEXT V:SOUND 0
   ,0,0,0:FOR P=1 TO 30:NEXT P
WI 210 IF PEEK(764)=255 THEN RETURN
IK 220 POP :POKE 764,255:SOUND 0,0,0,0
JG 230 GRAPHICS 0:POKE 752,1:SETCOLOR 2,0
   ,0:? :? "     CURRENT FOREIGN EXCHANG
   E  "
AG 240 ? :? " FOR THIS PROGRAM, YOU WILL
   NEED"
CK 250 ? "TODAY'S NEWSPAPER."
QT 260 ? :? " THERE, YOU WILL FIND THE LI
   ST OF"
OC 270 ? "CURRENT FOREIGN EXCHANGES."
VM 280 ? :? " WITH THIS LIST AND THIS PRO
   GRAM."
AX 290 ? "WE WILL BE ABLE TO CALCULATE AN
   D"
PG 300 ? "EXCHANGE MONEYS TO AND FROM ANY
   "
EW 310 ? "CURRENCY YOU WISH."
UK 320 ? :? "          PRESS ANY KEY    ":
   GOSUB 440
CY 330 IF PEEK(764)=255 THEN 330
XM 340 POKE 764,255:? "↰"
QG 350 POKE 752,1:SETCOLOR 2,0,0:? :? "
          EXCHANGE OPTIONS        "
DI 360 ? :? "1. HOME COUNTRY TO FOREIGN C
   OUNTRY"
UP 370 ? :? "2. FOREIGN COUNTRY TO HOME C
   OUNTRY"
GQ 380 ? :? "3. FOREIGN COUNTRY TO FOREIG
   N COUNTRY"
DZ 390 ? :? "        SELECT (1, 2  OR 3):";:
   GOSUB 440:INPUT OPTION
KW 400 POKE 764,255:GOSUB 410:GOTO 530
PM 410 REM SCROLL OFF SCREEN WITH SOUND
FX 420 FOR R=1 TO 23:? " ":SOUND 0,R*8,8,
   10:NEXT R:SOUND 0,0,0,0:RETURN
CC 440 REM INPUT SOUND
TP 450 C=INT(RND(1)*20)*10+40
IY 460 FOR A=C TO C-15 STEP -2
ZX 470 SOUND 0,A,10,A-C+15:SOUND 1,A+10,1
   0,A-C+15
DI 480 NEXT A
WW 490 FOR R=1 TO 2:FOR B=12 TO 0 STEP -3
SW 500 SOUND 0,A,10,B:SOUND 1,A+10,10,B
HK 510 NEXT B:NEXT R
ZF 520 RETURN
UZ 525 REM DISPLAY 44 COUNTRIES
MI 530 GRAPHICS 0:SETCOLOR 2,13,2:SETCOLO
   R 4,13,2
LK 540 POKE 752,1:RESTORE 2000
ZY 550 READ NUM,PLACE1$,CUR1$:SOUND 0,(NU
   M+10)*1.5,10,10:SOUND 1,(NUM+10)*3,10,
   10
NE 560 IF NUM<10 THEN POSITION 3,NUM-1
OR 570 IF NUM>9 THEN POSITION 2,NUM-1
WF 580 ? NUM;".";PLACE1$
XD 590 IF NUM<22 THEN SOUND 0,0,0,0:SOUND
    1,0,0,0:GOTO 550
ZT 620 READ NUM,PLACE1$,CUR1$:SOUND 0,(NU
```

continued on next page

```
   M+10)*1.5,10,10:SOUND 1,(NUM+10)*3,10,
   10
FL 630 POSITION 20,NUM-23
VY 640 ? NUM;".";PLACE1$
UP 650 IF NUM<44 THEN SOUND 0,0,0,0:SOUND
    1,0,0,0:GOTO 620
UG 660 GOSUB 440
LH 670 IF OPTION=1 THEN GOSUB 790:GOTO 69
   0
FX 680 ? "      COUNTRY TO EXCHANGE FROM 
   B";
LR 690 INPUT N1
IO 700 RESTORE 2000:GOSUB 440
EP 710 READ NUM,PLACE1$,CUR1$:IF NUM=N1 T
   HEN 730
OJ 720 GOTO 710
HE 730 IF OPTION=2 THEN GOSUB 790:GOTO 75
   0
FA 740 ? "       COUNTRY TO EXCHANGE TO  
   B";
LW 750 INPUT N2
KA 760 RESTORE 2000:GOSUB 410:? "↖"
ES 770 READ NUM,PLACE2$,CUR2$:IF NUM=N2 T
   HEN 800
RJ 780 GOTO 770
HG 790 ? "          YOUR HOME COUNTRY     
   B";:RETURN
TB 800 GOSUB 1140
SJ 810 IF OPTION=1 THEN RATE1=1:GOTO 860
RW 820 ? "WHAT IS THE CURRENT EXCHANGE RA
   TE"
PS 830 ? "OF THE ";PLACE1$;" ";CUR1$;:INP
```




```
   UT RATE1
TJ 840 GOSUB 1140
YK 850 IF OPTION=2 THEN RATE2=1:GOTO 890
SE 860 ? "WHAT IS THE CURRENT EXCHANGE RA
   TE"
TW 870 ? "OF THE ";PLACE2$;" ";CUR2$;:INP
   UT RATE2
TR 880 GOSUB 1140
NI 890 ? "HOW MANY ";PLACE2$;" ";CUR2$;"'
   S"
QH 900 ? "WOULD YOU LIKE TO BUY ";:INPUT
   AMOUNT:GOSUB 440
YA 910 IF OPTION=1 THEN TOTAL=RATE1*RATE2
   *AMOUNT
PM 920 IF OPTION=2 THEN TOTAL=AMOUNT/RATE
   1
RZ 930 IF OPTION=3 THEN T=AMOUNT/RATE1:TO
   TAL=T*RATE2
QR 940 TOTAL=INT(100*TOTAL+0.5)/100
YR 950 ? :? :? AMOUNT;" ";PLACE2$;" ";CUR
   2$;"'S"
PT 960 ? :? "WILL COST YOU":? :?
KU 970 IF TOTAL<10 THEN N=0.1:GOTO 1010
YM 980 IF TOTAL<100 THEN N=1:GOTO 1010
SC 990 IF TOTAL<1000 THEN N=11:GOTO 1010
HR 1000 N=251
HV 1010 FOR ADD=0 TO TOTAL STEP N:? "↑";A
   DD:SOUND 0,2,12,10:SOUND 0,0,0,0:FOR P
   =1 TO 5:NEXT P:NEXT ADD
FU 1020 ? "↑";TOTAL;" ";PLACE1$;" ";CUR1$
   ;"'S"
TN 1030 POSITION 2,21:? "PRESS OPTION FOR
    DIFFERENT COUNTRIES"
RI 1040 POSITION 2,22:? "PRESS SELECT TO 
   ALTER AMOUNT ENTERED"
EP 1070 POSITION 8,21:? "OPTION":FOR P=1
   TO 5:NEXT P
WZ 1080 POSITION 8,22:? "SELECT":FOR P=1
   TO 5:NEXT P:POKE 53279,0
MT 1090 FOR R=1 TO 25:IF PEEK(53279)=3 TH
   EN RESTORE 2000:GOSUB 410:GRAPHICS 0:S
   ETCOLOR 2,13,2:GOTO 340
RF 1100 IF PEEK(53279)=5 THEN GOSUB 410:?
    "↖":GOTO 880
OK 1110 NEXT R:GOTO 1030
CD 1140 POKE 82,0:GOSUB 440
PE 1150 ? :? "┌──────────────────────────
   ──────────┐"
PN 1160 ? :? "└──────────────────────────
   ──────────┘"
XS 1170 POKE 82,2:? "↑↑↑↑↑":RETURN
NZ 1990 REM DATA FOR 44 COUNTRIES
ZB 2000 DATA 1,AUSTRALIA,DOLLAR,2,AUSTRIA
   ,SHILLING,3,BAHAMAS,DOLLAR,4,BARBADOS,
   DOLLAR,5,BELGIUM,FRANC,6,BERMUDA
NJ 2010 DATA DOLLAR,7,CANADA,DOLLAR,8,CAY
   MAN,DOLLAR,9,CHINA,RENMINBI,10,CZECHOS
   LOVAKIA,CROWN,11,DENMARK,KRONER,12
XF 2020 DATA EAST CARIBBEAN,DOLLAR,13,FIJ
   I,DOLLAR,14,FINLAND
AT 2025 DATA FINNMARK,15,FRANCE,FRANC,16,
   GERMANY(WEST),MARK,17,GREECE
DY 2030 DATA DRACHMA,18,GUYANA,DOLLAR,19,
   HONG KONG,DOLLAR,20
ES 2035 DATA INDIA,RUPEE,21,INDONESIA,RUP
   IAH,22,IRELAND,PUNT,23,ITALY
KH 2040 DATA LIRE,24,JAMAICA,DOLLAR,25,JA
   PAN,YEN,26,KUWAIT,DINAR,27,MALAYSIA,DO
   LLAR,28,MEXICO,PESO,29,NETHERLANDS
DY 2050 DATA GUILDER,30,NEW ZEALAND,DOLLA
   R,31,NORWAY,KRONER,32
EK 2055 DATA PAKISTAN,RUPEE,33,PORTUGAL,E
   SCUDO,34,SAUDI ARABIA,RIYA
XM 2060 DATA 35,SINGAPORE,DOLLAR,36,SOUTH
    AFRICA,RAND,37,SPAIN,PESETA,38,SWEDEN
   ,KRONER,39,SWITZERLAND,FRANC
OZ 2070 DATA 40,TANZANIA,SCHILLING,41,TRI
   NIDAD&TOBAGO,DOLLAR,42,UNITED STATES,D
   OLLAR,43,UNITED KINGDOM,POUND
ZY 2080 DATA 44,VENEZUELA,BOLIVAR
```

# INCOME TAX SPREADSHEET

Article on page 22.

## TEMPLATE SECTION 1

```
       A        B        C       D        E
2   RECALCULATE THIS SHEET FOUR TIMES
3   1983 INCOME TAX CALCULATOR
4   LINE
5   -------
6   1040     FILING STATUS (1= SINGLE
7   1-5       (2= MARRIED-JOINT,
8             (3= MARRIED-SEPARATE
9             (4= HEAD/HOUSEHOLD,
1Ø            (5= WIDOW(ER).......          Ø
11
12  6e       TOTAL EXEMPTIONS =             Ø
13           ----------- INCOME ---------
14  7        WAGES                         $Ø
15  8        INTEREST (Sched B)             Ø
16  9a       DIVIDENDS(S.B)       Ø
17  9b-C     EXCLUSION            Ø         Ø
18  1Ø       TAX REFUNDS                    Ø
19  11       ALIMONY                        Ø
2Ø  12       BUSINESS (Sch C)               Ø
21  13       CAPITAL GAIN(Sch D)            Ø
22  14       4Ø% CAP GAIN                   Ø
23  15       SUPP GAINS                     Ø
24  16       FULLY TAXABLE PENSION          Ø
25  17b      OTHER PENSION,TAXABLE          Ø
26  18       RENTS, ETC. (Sch E)            Ø
27  19       FARM (Sch F)                   Ø
28  2Øb      TAXABLE UNEMPLOYMENT           Ø
29  21       OTHER INCOME                   Ø
3Ø  22          TOTAL INCOME               $Ø
31  23       MOVING EXP                     Ø
32  24       EMPLOYEE BUS. (21Ø6)           Ø
33  25       IRA DEDUCTION                  Ø
34  26       KEOGH                          Ø
35  27       WITHDRAWAL PENALTY             Ø
36  28       ALIMONY                        Ø
37  29       SCHED W COUPLE DED             Ø
38  3Ø       DISABILITY EXCLUSION           Ø
39  31         TOTAL INCOME ADJ            $Ø
4Ø  32&33    *** ADJ GROSS INCOME          $Ø
41  34a/b    ITEMZD DED. (Sch A)            Ø
42  35       NET INCOME                    $Ø
43  36       EXEMPTION VALUE                Ø
44  37       NET TAXABLE INCOME             Ø
45  38       RATE SCHED TAX       Ø
46           SCHED G TAX          Ø         Ø
47  39       ADDITIONAL TAXES               Ø
48  4Ø        *** TOTAL TAX                $Ø
49  41/44    TAX CREDITS          Ø
5Ø  45       CARE CRED 2241       Ø
51  46-48    OTHER CREDITS        Ø         Ø
52  49       BALANCE                       $Ø
53  5Ø       SELF EMPLOY (Sch SE)           Ø
54  51/55    OTHER TAXES                    Ø
55  56       TOTAL TAX                     $Ø
56  57       WITHHELD                       Ø
57  58       83 ESTIMATED PAYMENTS          Ø
58  59       EARNED INCOME                  Ø
59  6Ø       FORM 4868                      Ø
6Ø  61       EXCESS FICA                    Ø
61  62/63    MISC TAXES                     Ø
62  64         *** TOTAL PAYMENTS          $Ø
63  65       OVERPAID                      $Ø
64  68       OWED                          $Ø
```

## TEMPLATE SECTION 2

```
       A         B        C       D        E
65
66   SCHEDULE X SINGLE
67   2,3ØØ         Ø   Ø.11
68   3,4ØØ       121   Ø.131Ø4ØTAX               Ø
69   4,4ØØ       251   Ø.15
7Ø   8,5ØØ       866   Ø.17SCHED G TAXES
71  1Ø,8ØØ     1,257   Ø.19LINE 23               Ø
72  12,9ØØ     1,656   Ø.21LINE 21               Ø
73  15,ØØØ     2,Ø97   Ø.24LINE 2Ø               Ø
74  18,2ØØ     2,865   Ø.28LINE 12               Ø
75  23,5ØØ     4,349   Ø.32LINE 14               Ø
76  28,8ØØ     6,Ø45   Ø.36
77  34,1ØØ     7,953   Ø.4Ø
78  41,5ØØ    1Ø,913   Ø.45
79  55,3ØØ    17,123   Ø.5Ø
8Ø   SCHEDULE Y MARRIED & WIDOW(ER)
81       1         Ø   Ø.ØØ
82   3,4ØØ         Ø   Ø.11    FLAG              Ø
83   5,5ØØ       231   Ø.13
84   7,6ØØ       5Ø4   Ø.151Ø4ØTAX               Ø
85  11,9ØØ     1,149   Ø.17SCHEDULE G TAXES
86  16,ØØØ     1,846   Ø.19LINE 23               Ø
87  2Ø,2ØØ     2,644   Ø.23LINE 21               Ø
88  24,6ØØ     3,656   Ø.26LINE 2Ø               Ø
89  29,9ØØ     5,Ø34   Ø.3ØLINE 12               Ø
9Ø  35,2ØØ     6,624   Ø.35LINE 14               Ø
91  45,8ØØ    1Ø,334   Ø.4Ø
92  6Ø,ØØØ    16,1Ø4   Ø.44
93  85,6ØØ    27,278   Ø.48
941Ø9,4ØØ     38,7Ø2   Ø.5Ø
95   SCHEDULE Y SEPARATE
96       1         Ø   Ø.ØØ
97   1,7ØØ         Ø   Ø.11    FLAG              Ø
98   2,75Ø       116   Ø.13
99   3,8ØØ       252   Ø.151Ø4ØTAX               Ø
1ØØ  5,95Ø       575   Ø.17SCHEDULE G TAXES
1Ø1  8,ØØØ       923   Ø.19LINE 23               Ø
1Ø2 1Ø,1ØØ     1,322   Ø.23LINE 21               Ø
1Ø3 12,3ØØ     1,828   Ø.26LINE 2Ø               Ø
1Ø4 14,95Ø     2,517   Ø.3ØLINE 12               Ø
1Ø5 17,6ØØ     3,312   Ø.35LINE 14               Ø
1Ø6 22,9ØØ     5,167   Ø.4Ø
1Ø7 3Ø,ØØØ     8,ØØ7   Ø.44
1Ø8 42,8ØØ    13,639   Ø.48
1Ø9 54,7ØØ    19,351   Ø.5Ø
11Ø  SCHEDULE Z HEAD OF HOUSEHOLD
111      1         Ø   Ø.ØØ
112  2,3ØØ         Ø   Ø.11    FLAG              Ø
113  4,4ØØ       231   Ø.13
114  6,5ØØ       5Ø4   Ø.151Ø4ØTAX               Ø
115  8,7ØØ       834   Ø.18SCHEDULE G TAXES
116 11,8ØØ     1,392   Ø.19LINE 23               Ø
117 15,ØØØ     2,ØØØ   Ø.21LINE 21               Ø
118 18,2ØØ     2,672   Ø.25LINE 2Ø               Ø
119 23,5ØØ     3,997   Ø.29LINE 12               Ø
12Ø 28,8ØØ     5,534   Ø.34LINE 14               Ø
121 34,1ØØ     7,336   Ø.37
122 44,7ØØ    11,258   Ø.44
123 6Ø,6ØØ    18,254   Ø.48
124 81,8ØØ    28,43Ø   Ø.5Ø
```

continued on next page

# TEMPLATE SECTION 3

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 125 | SCHEDULE A | | | | |
| 126 | MEDICAL EXPENSES | | | | |
| 127 | 1 | PRESCRIPTIONS | | $0 | |
| 128 | 2-3 | LESS 1% | | 0 | $0 |
| 129 | 4a | DR,DDS,ETC. | | | 0 |
| 130 | 4b | TRANSPORTATION | | | 0 |
| 131 | 4c | OTHER | | | 0 |
| 132 | 4c | | | | 0 |
| 133 | 5 | TOTAL | | | $0 |
| 134 | 6 | LESS 5% | | | 0 |
| 135 | 7 | DEDUCTION | | | $0 |
| 136 | TAXES | | | | |
| 137 | 8 | INCOME | | | 0 |
| 138 | 9 | REAL ESTATE | | | 0 |
| 139 | 10a/b | SALES | | | 0 |
| 140 | 11 | OTHER | | | 0 |
| 141 | 12 | DEDUCTION | | | $0 |
| 142 | INTEREST | | | | |
| 143 | 13a | INT. FINANCIAL | | | 0 |
| 144 | 13b | INT. OTHER | | | 0 |
| 145 | 14 | CREDIT CARDS | | | 0 |
| 146 | 15 | OTHER | | | 0 |
| 147 | 15 | OTHER | | | 0 |
| 148 | 16 | DEDUCTION | | | $0 |
| 149 | CONTRIBUTIONS S | | | | |
| 150 | 17a | CASH SMALL | | | 0 |
| 151 | 17b | CASH LARGE | | | 0 |
| 152 | 18 | NON-CASH | | | 0 |
| 153 | 19 | CARRYOVER | | | 0 |
| 154 | 20 | DEDUCTION | | | $0 |
| 155 | 21 | CASULTY LOSS | | | $0 |
| 156 | MISC | | | | |
| 157 | 22 | DUES | | | 0 |
| 158 | 23 | TAX PREP | | | 0 |
| 159 | 24 | OTHER | | | 0 |
| 160 | 24 | OTHER | | | 0 |
| 161 | 25 | DEDUCTION | | | $0 |
| 162 | TOTALS | | | | |
| 163 | 26 | SUM ABOVE | | | $0 |
| 164 | 27 | STATUS DEDUCTION | | | 0 |
| 165 | 28 | TOTAL | | | $0 |

# TEMPLATE SECTION 4

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 190 | SCHEDULE G INCOME AVERAGING | | | | |
| 191 | 1 '79 1040 L 34 | | | 0 | |
| 192 | 2 '79 EXEMPNS * $1000 | | | 0 | $0 |
| 193 | 4 '80 1040 L 34 | | | 0 | |
| 194 | 5 '80 EXEMPNS * $1000 | | | 0 | 0 |
| 195 | 7 '81 1040 L 34 | | | | 0 |
| 196 | 8 '82 1040 L 37 | | | | 0 |
| 197 | 9 OUTSIDE US INCOME 79-82 | | | | 0 |
| 198 | 10 TOTAL INCOME | | | | $0 |
| 199 | 12 1983 1040 L 37 | | | | 0 |
| 200 | 13 PREMATURE DISTRIBUTION | | | | 0 |
| 201 | 14 SUBTOTAL | | | | $0 |
| 202 | 15 COMMUNITY/SEPARATE | | | | 0 |
| 203 | 16 SUBTOTAL | | | | $0 |
| 204 | 17 30%*L10 (L 11) | | | | 0 |
| 205 | 18 AVERAGEABLE INCOME | | | | 0 |
| 206 | 19 20% OF AVERAGEABLE INCOME | | | | 0 |
| 207 | 20 30% OF TOTAL INC (L10) | | | | 0 |
| 208 | 21 SUBTOTAL | | | | $0 |
| 209 | 22 COMMUNITY/SEPARATE (L15) | | | | 0 |
| 210 | 23 SUBTOTAL | | | | $0 |
| 211 | 24 TAX ON LINE 23 | | | | 0 |
| 212 | 25 TAX ON LINE 21 | | | 0 | |
| 213 | 26 TAX ON LINE 20 | | | 0 | |
| 214 | 27 NET TAX & 25%*NET | | | | $0 |
| 215 | 29 TAX ON LINE 12 | | | 0 | |
| 216 | 30 TAX ON L.14 & NET | | | 0 | $0 |
| 217 | 32 TOTAL TAXES TO 1040 L38 | | | | $0 |

# TEMPLATE SECTION 5

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 166 | SCHEDULE B | | | | |
| 167 | INTEREST PART I | | | | |
| 168 | 1 | SELLER-FINANCED | | | 0 |
| 169 | 2 | OTHER INTEREST | | | 0 |
| 170 | 2 | | | | 0 |
| 171 | 2 | | | | 0 |
| 172 | 3 | TOTAL NON ASC | | | $0 |
| 173 | 4 | ALL SAVERS | | | 0 |
| 174 | 4 | ALL SAVERS | | | 0 |
| 175 | 5 | ALL SAVERS TOTAL | | | $0 |
| 176 | | MAX DED | | | 1,000 |
| 177 | | DED TAKEN 82 | | | 0 |
| 178 | 6 | ASC EXCLUSION | | | 1,000 |
| 179 | 7 | ASC BALANCE | | | 0 |
| 180 | 8 | TOTAL INTEREST | | | $0 |
| 181 | DIVIDENDS PART II | | | | |
| 182 | 9 | PAYOR | | | 0 |
| 183 | 9 | PAYOR | | | 0 |
| 184 | 9 | PAYOR | | | 0 |
| 185 | 10 | TOTAL | | | $0 |
| 186 | 11 | GAIN DISTRIB | | 0 | |
| 187 | 12 | NONTAXABLE | | 0 | |
| 188 | 13-14 | UTILITY EXCL | | 0 | 0 |
| 189 | 15 | TOTAL | | | $0 |

# TEMPLATE SECTION 6

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 218 | CHILD CARE CREDIT SCHED 2441 | | | | |
| 219 | 3 EXPENSES PAID | | | | $0 |
| 220 | 4a OWN EARNED INCOME | | | 0 | |
| 221 | 4b SPOUSE'S E. INCOME | | | 0 | 0 |
| 222 | 5 EXPENSE BASE | | | | 0 |
| 223 | PERCENTAGE | | 0.30 | | |
| 224 | TABLE | 10,000 | 0.29 | | |
| 225 | | 12,000 | 0.28 | | |
| 226 | | 14,000 | 0.27 | | |
| 227 | | 16,000 | 0.26 | | |
| 228 | | 18,000 | 0.25 | | |
| 229 | | 20,000 | 0.24 | LINE 6 | |
| 230 | | 22,000 | 0.23DEDUCTIBLE | | |
| 231 | | 24,000 | 0.22PERCENT | | 30.00% |
| 232 | | 26,000 | 0.21 | | |
| 233 | | 28,000 | 0.20 | | |
| 234 | 7 1983 PERCENTAGE AMOUNT | | | | 0 |
| 235 | 8 1982 EXP PAID IN 83 @ 82% | | | | 0 |
| 236 | 9 SUM OF 83 & 82 | | | | 0 |
| 237 | 10a TAX 1040 L 40 | | | | 0 |
| 238 | 10b 1040 LINES 41-44 | | | | 0 |
| 239 | 10c NET OF 10a & 10b | | | | $0 |
| 240 | 11 DEDUCTIBLE AMOUNT | | | | $0 |

## *LISTING 1*

```
D16 E189
D45 E68+E84+E99+E114
D46 E217
D50 E240
D68 1040TAX
D70 SCHED G TAXES
D71 LINE 23
D72 LINE 21
D73 LINE 20
D74 LINE 12
D75 LINE 14
D82 FLAG
D84 1040TAX
D85 SCHEDULE G TAXES
D86 LINE 23
D87 LINE 21
D88 LINE 20
D89 LINE 12
D90 LINE 14
D97 FLAG
D99 1040TAX
D100 SCHEDULE G TAXES
D101 LINE 23
D102 LINE 21
D103 LINE 20
D104 LINE 12
D105 LINE 14
D112 FLAG
D114 1040TAX
D115 SCHEDULE G TAXES
D116 LINE 23
D117 LINE 21
D118 LINE 20
D119 LINE 12
D120 LINE 14
D128 E40*0.01
D212 E72+E87+E102+E117
D213 E73+E88+E103+E118
D215 E74+E89+E104+E119
D216 E75+E90+E105+E120
D229 LINE 6
D230 DEDUCTIBLE
D231 PERCENT
E15 E180
E17 D16
E30 @SUM(E29:E14)
E39 @SUM(E38:E31)
E40 E30-E39
E41 E165
E42 E40-E41
E43 1000*E12
E44 E42-E43
E46 @IF D46>0 AND D46<D45 THEN D4
6 ELSE D45
E48 E47+E46
E51 D51+D50+D49
E52 E48-E51
E55 E54+E53+E52
E62 @SUM(E61:E56)
E63 @IF E62>E55 THEN E62-E55 ELSE
 0
E64 @IF E55>E62 THEN E55-E62 ELSE
 0
E68 @IF [E10]=1 AND [E44]>2300 TH
EN @LOOKUP([E44],A67:A79,1)+@LOOK
UP([E44],A67:A79,2)*([E44]-@LOOKU
P([E44],A67:A79,0)) ELSE 0
E71 @IF [E10]=1 AND [E210]>2300 T
HEN @LOOKUP([E210],A67:A79,1)+@LO
OKUP([E210],A67:A79,2)*([E210]-@L
OOKUP([E210],A67:A79,0)) ELSE 0
E72 @IF [E10]=1 AND [E208]>2300 T
HEN @LOOKUP([E208],A67:A79,1)+@LO
OKUP([E208],A67:A79,2)*([E208]-@L
OOKUP([E208],A67:A79,0)) ELSE 0
E73 @IF [E10]=1 AND [E207]>2300 T
HEN @LOOKUP([E207],A67:A79,1)+@LO
OKUP([E207],A67:A79,2)*([E207]-@L
OOKUP([E207],A67:A79,0)) ELSE 0
E74 @IF [E10]=1 AND [E199]>2300 T
HEN @LOOKUP([E199],A67:A79,1)+@LO
OKUP([E199],A67:A79,2)*([E199]-@L
OOKUP([E199],A67:A79,0)) ELSE 0
E75 @IF [E10]=1 AND [E201]>2300 T
HEN @LOOKUP([E201],A67:A79,1)+@LO
OKUP([E201],A67:A79,2)*([E201]-@L
OOKUP([E201],A67:A79,0)) ELSE 0
E82 @IF [E10]=2 OR E10=5 THEN 1 E
LSE 0
E84 (@LOOKUP([E44],A81:A94,1)+@LO
OKUP([E44],A81:A94,2)*([E44]-@LOO
KUP([E44],A81:A94,0)))*E82
E86 (@LOOKUP([E210],A81:A94,1)+@L
OOKUP([E210],A81:A94,2)*([E210]-@
LOOKUP([E210],A82:A94,0)))*E82
E87 (@LOOKUP([E208],A81:A94,1)+@L
OOKUP([E208],A81:A94,2)*([E208]-@
LOOKUP([E208],A82:A94,0)))*E82
E88 (@LOOKUP([E207],A81:A94,1)+@L
OOKUP([E207],A81:A94,2)*([E207]-@
LOOKUP([E207],A82:A94,0)))*E82
E89 (@LOOKUP([E199],A81:A94,1)+@L
OOKUP([E199],A81:A94,2)*([E199]-@
LOOKUP([E199],A82:A94,0)))*E82
E90 (@LOOKUP([E201],A81:A94,1)+@L
OOKUP([E201],A81:A94,2)*([E201]-@
LOOKUP([E201],A82:A94,0)))*E82
E97 @IF [E10]=3 THEN 1 ELSE 0
E99 (@LOOKUP([E44],A96:A109,1)+@L
OOKUP([E44],A96:A109,2)*([E44]-@L
OOKUP([E44],A96:A109,0)))*E97
E101 (@LOOKUP([E210],A96:A109,1)+
@LOOKUP([E210],A96:A109,2)*([E210
]-@LOOKUP([E210],A97:A109,0)))*E9
7
E102 (@LOOKUP([E208],A96:A109,1)+
@LOOKUP([E208],A96:A109,2)*([E208
]-@LOOKUP([E208],A97:A109,0)))*E9
7
E103 (@LOOKUP([E207],A96:A109,1)+
```

continued on next page

```
@LOOKUP([E2Ø7],A96:A1Ø9,2)*([E2Ø7
]-@LOOKUP([E2Ø7],A97:A1Ø9,Ø)))*E9
7
E1Ø4 (@LOOKUP([E199],A96:A1Ø9,1)+
@LOOKUP([E199],A96:A1Ø9,2)*([E199
]-@LOOKUP([E199],A97:A1Ø9,Ø)))*E9
7
E1Ø5 (@LOOKUP([E2Ø1],A96:A1Ø9,1)+
@LOOKUP([E2Ø1],A96:A1Ø9,2)*([E2Ø1
]-@LOOKUP([E2Ø1],A97:A1Ø9,Ø)))*E9
7
E112 @IF [E1Ø]=4 THEN 1 ELSE Ø
E114 (@LOOKUP([E44],A111:A124,1)+
@LOOKUP([E44],A111:A124,2)*([E44]
-@LOOKUP([E44],A111:A124,Ø)))*E11
2
E116 (@LOOKUP([E21Ø],A111:A124,1)
+@LOOKUP([E21Ø],A111:A124,2)*([E2
1Ø]-@LOOKUP([E21Ø],A112:A124,Ø)))
*E112
E117 (@LOOKUP([E2Ø8],A111:A124,1)
+@LOOKUP([E2Ø8],A111:A124,2)*([E2
Ø8]-@LOOKUP([E2Ø8],A112:A124,Ø)))
*E112
E118 (@LOOKUP([E2Ø7],A111:A124,1)
+@LOOKUP([E2Ø7],A111:A124,2)*([E2
Ø7]-@LOOKUP([E2Ø7],A112:A124,Ø)))
*E112
E119 (@LOOKUP([E199],A111:A124,1)
+@LOOKUP([E199],A111:A124,2)*([E1
99]-@LOOKUP([E199],A112:A124,Ø)))
*E112
E12Ø (@LOOKUP([E2Ø1],A111:A124,1)
+@LOOKUP([E2Ø1],A111:A124,2)*([E2
Ø1]-@LOOKUP([E2Ø1],A112:A124,Ø)))
*E112
E128 @IF D127-D128>Ø THEN D127-D1
28 ELSE Ø
E133 @SUM(E132:E128)
E134 E4Ø*Ø.Ø5
E135 @IF E133-E134>Ø THEN E133-E1
34 ELSE Ø
E141 @SUM(E14Ø:E137)
E148 @SUM(E147:E143)
E154 @SUM(E153:E15Ø)
E161 @SUM(E16Ø:E157)
E163 E161+E155+E154+E148+E141+E13
5
E164 @IF E1Ø=2 OR E1Ø=5 THEN 34ØØ
 ELSE  @IF E1Ø=1 OR E1Ø=4 THEN 23
ØØ ELSE  @IF E1Ø=3 THEN 17ØØ ELSE
E165 @IF E163-E164>Ø THEN E163-E1
64 ELSE Ø
E172 @SUM(E171:E168)
E175 E174+E173
E176 @IF E1Ø=2 THEN 2ØØØ ELSE 1ØØ
Ø
E178 E176-E177
E179 @IF E175>E178 THEN E175-E178
 ELSE Ø
E18Ø E179+E172
E185 E184+E183+E182
E188 D188+D187+D186
E189 E185-E188
E192 @IF D191-D192>Ø THEN D191-D1
92 ELSE Ø
E194 @IF D193-D194>Ø THEN D193-D1
94 ELSE Ø
E198 @SUM(E192:E197)
E199 E44
E2Ø1 E199-E2ØØ
E2Ø3 E2Ø1-E2Ø2
E2Ø4 E198*Ø.3
E2Ø5 E2Ø3-E2Ø4
E2Ø6 E2Ø5*Ø.2
E2Ø7 E2Ø4
E2Ø8 E2Ø7+E2Ø6
E2Ø9 E2Ø2
E21Ø E2Ø9+E2Ø8
E211 E71+E86+E1Ø1+E116
E214 (D212-D213)*Ø.25
E216 D215-D216
E217 @IF E198>Ø THEN E216+E214+E2
11 ELSE Ø
E221 @IF D22Ø<D221 AND D221>Ø THE
N D22Ø ELSE  @IF D221=Ø THEN D22Ø
 ELSE D221
E222 @IF E219<E221 THEN E219 ELSE
 E221
E231 @LOOKUP(E4Ø,B223:B233,1)
E234 E222*E231
E236 E235+E234
E237 E48
E238 D49
E239 E237-E238
E24Ø @IF E239<E236 THEN E239 ELSE
 E236
```

# TECH TIPS

POKE 16,64:POKE 53774,112 will disable the [BREAK] key. To keep the key disabled, you must use these POKEs after every PRINT, OPEN and GRAPHICS statement.

PEEK (53770) will produce a random number between zero and 255.

If you need to enter DOS, but you don't want to lose your program and you don't have a MEM.SAV file—Create a MEM.SAVE file from BASIC by typing X= USR(5947) NOTE: To return to BASIC, XL owners must press the [RESET] key after the disk stops turning. The 400 and 800 will generate an ERROR 9 message when the MEM.SAV file has been created.

# DRUM SYNTH/BASS SYNTH

## LISTING 1

Article on page 26.

```
ES 10 REM BASYNTH
SD 12 REM BY GLENN GUTIERREZ
RN 14 REM ANTIC MAGAZINE
VX 20 SOUND 0,0,0,0:POKE 53768,7:GOSUB 30000
KV 30 P=PEEK(764):IF P=255 THEN 30
PF 35 POKE 764,255
OS 40 TRAP 30:N=NTS(KEY(P)):IF N=0 THEN GOTO 30
CU 50 POKE 53760,N:POKE 53764,N+1
RD 60 FOR J=15 TO 0 STEP -0.5:POKE 53761,160+J:POKE 53765,160+J
BP 70 IF PEEK(764)<>255 THEN 30
DU 80 NEXT J:GOTO 30
KK 30000 GRAPHICS 0:POKE 712,144:POKE 709,12:POKE 710,144:POKE 711,150:POKE 752,1
UI 30010 DIM KEY(63),NTS(37)
IF 30020 DL=PEEK(560)+256*PEEK(561):POKE DL+3,66:POKE DL+11,7:POKE DL+12,6
XC 30030 POKE DL+23,6:POKE DL+24,6:POKE DL+26,65:POKE DL+27,PEEK(560):POKE DL+28,PEEK(561)
ZZ 30040 POSITION 7,1:? "Glenn Gutierrez presents"
DR 30050 POKE 708,15:POSITION 6,6:? #6;"BASYNTH"
PD 30055 POSITION 26,6:? #6;"▸▸▸▸▸▸▸▸"
VV 30060 POSITION 10,12:? "Written on 8/29/84"
KA 30070 POSITION 10,13:? "for ANTIC Magazine"
PS 30075 RESTORE 31000:FOR J=0 TO 63:READ D:KEY(J)=D:NEXT J:FOR J=1 TO 37:READ D:NTS(J)=D:NEXT J
VD 30080 POSITION 24,17:? "press start":POSITION 14,18:? "or any key"
QI 30090 IF PEEK(53279)<>6 AND PEEK(764)=255 THEN 30090
XL 30100 POKE 764,255:GRAPHICS 18:POKE 712,192:POKE 559,0:RETURN
HR 31000 DATA 14,11,16,0,0,0,0,0,32,0
WN 31001 DATA 34,29,0,30,36,37,6,0,5,0
HK 31002 DATA 0,8,3,1,23,0,21,26,0,0
VZ 31003 DATA 19,0,13,0,15,10,0,12,17,0
WE 31004 DATA 24,0,22,27,0,25,20,18,31,0
OH 31005 DATA 33,28,0,0,35,0,0,9,4,0
WH 31006 DATA 0,7,2,0
GS 31010 DATA 243,230,217,204,193,182
JR 31011 DATA 173,162,153,144,136,128
HZ 31012 DATA 121,114,108,102,96,91
AA 31013 DATA 85,81,76,72,68,64
OB 31014 DATA 60,57,53,50,47,45
DM 31015 DATA 42,40,37,35,33,31
MC 31016 DATA 29
```

## LISTING 2

```
MM 10 REM SYNDRUM
SD 12 REM BY GLENN GUTIERREZ
RN 14 REM ANTIC MAGAZINE
MU 20 GOSUB 30000
UM 30 GRAPHICS 17:POKE 708,15:POKE 712,192:POKE 559,0
RK 35 POSITION 5,9:? #6;"SLOW  MODE"
VI 40 P=PEEK(764)
BM 41 S=PEEK(53279):IF S=7 THEN 44
FA 42 SCR=SCR=0:POKE 559,34*SCR
RR 43 IF PEEK(53279)=S THEN 43
BO 44 IF P=255 THEN 40
SM 50 TRAP 40:POKE 764,255:IF KEY(P)=0 THEN POKE 53761,0:POKE 53763,0:GOTO 40
HP 60 POKE 53761,0:GOSUB KEY(P):GOTO 40
XT 99 REM BASS DRUM
HF 100 POKE 53768,1:POKE 53760,0:POKE 53761,193:POKE 53761,31:POKE 53761,28
SL 110 FOR J=8 TO 0 STEP -4:POKE 53761,0:POKE 53761,16+J
ZQ 120 IF PEEK(764)<>255 THEN POP :RETURN
MX 130 NEXT J:RETURN
ML 199 REM SNARE DRUM
NV 200 POKE 53768,0:POKE 53760,0:POKE 53761,193:POKE 53763,31:POKE 53761,27:POKE 53760,3:POKE 53763,0
WS 210 FOR J=3 TO 0 STEP -0.2:POKE 53761,128+J
ZR 220 IF PEEK(764)<>255 THEN POP :RETURN
MY 230 NEXT J:RETURN
HK 299 REM SYN-DRUM
ZJ 300 POKE 53768,1:POKE 53763,31:POKE 53761,27:POKE 53760,1:POKE 53763,0
FH 310 FOR J=4 TO 0 STEP -0.4:POKE 53761,128+J*0.7:POKE 53762,200-J*40:POKE 53763,160+J
VC 320 IF PEEK(764)<>255 THEN POP :POKE 53763,0:RETURN
YS 330 NEXT J:POKE 53761,0:POKE 53763,0:RETURN
AV 399 REM REPEAT HIGH HAT
VS 400 POKE 53768,0
RZ 405 POKE 53760,0
HJ 410 FOR J=3 TO 0 STEP -5/(PADDLE(0)+1):POKE 53761,128+J
ZT 420 IF PEEK(764)<>255 THEN POP :RETURN
HR 430 NEXT J:GOTO 405
SS 499 REM HAND CLAP
SF 500 POKE 53768,0:POKE 53760,20:POKE 53762,5:POKE 53761,132
PR 510 FOR J=4 TO 0 STEP -0.5:POKE 53761,128+J:POKE 53763,INT(128+J/2)
VE 520 IF PEEK(764)<>255 THEN POP :POKE 53763,0:RETURN
NB 530 NEXT J:RETURN
LR 599 REM REPEAT TOM
WK 600 POKE 53768,1
EZ 605 POKE 53760,0:POKE 53761,193:POKE 53761,31
TE 610 FOR J=6 TO 0 STEP -4/(PADDLE(1)+1):POKE 53760,PADDLE(0)+27-J*2:POKE 53761,160+J
ZV 620 IF PEEK(764)<>255 THEN POP :RETURN
JB 630 NEXT J:GOTO 605
DO 699 REM TOM 1
AM 700 POKE 53768,1:POKE 53761,31:POKE 53763,27
TU 710 FOR J=6 TO 0 STEP -1:POKE 53760,255-J*20:POKE 53764,254-J*20:POKE 53761,160+J:POKE 53765,160+J
UV 720 IF PEEK(764)<>255 THEN POKE 53765,0:POKE 53764,0:POP :RETURN
```

continued on next page

```
ND 730 NEXT J:RETURN
DS 749 REM TOM 2
AW 750 POKE 53768,1:POKE 53761,31:POKE 53
   763,27
XL 760 FOR J=6 TO 0 STEP -1:POKE 53760,20
   0-J*20:POKE 53764,199-J*20:POKE 53761,
   160+J:POKE 53765,160+J
VF 770 IF PEEK(764)<>255 THEN POKE 53765,
   0:POKE 53764,0:POP :RETURN
NN 780 NEXT J:RETURN
EP 799 REM TOM 3
AN 800 POKE 53768,1:POKE 53761,31:POKE 53
   763,27
TB 810 FOR J=6 TO 0 STEP -1:POKE 53760,16
   9-J*20:POKE 53764,170-J*20:POKE 53761,
   160+J:POKE 53765,160+J
UW 820 IF PEEK(764)<>255 THEN POKE 53765,
   0:POKE 53764,0:POP :RETURN
NE 830 NEXT J:RETURN
ET 849 REM TOM 4
AX 850 POKE 53768,1:POKE 53761,31:POKE 53
   763,27
VX 860 FOR J=6 TO 0 STEP -1:POKE 53760,16
   0-J*20:POKE 53764,159-J*20:POKE 53761,
   160+J:POKE 53765,160+J
VG 870 IF PEEK(764)<>255 THEN POKE 53765,
   0:POKE 53764,0:POP :RETURN
NO 880 NEXT J:RETURN
FQ 899 REM TOM 5
AO 900 POKE 53768,1:POKE 53761,31:POKE 53
   763,27
BQ 910 FOR J=6 TO 0 STEP -1:POKE 53760,14
   9-J*20:POKE 53764,148-J*20:POKE 53761,
   160+J:POKE 53765,160+J
UX 920 IF PEEK(764)<>255 THEN POKE 53765,
   0:POKE 53764,0:POP :RETURN
NF 930 NEXT J:RETURN
CP 999 REM HIGH HAT
EZ 1000 POKE 53768,0
BD 1005 POKE 53760,0
RN 1010 FOR J=3 TO 0 STEP -0.5:POKE 53761
   ,128+J
NO 1020 IF PEEK(764)<>255 THEN POP :RETUR
   N
GR 1030 NEXT J:RETURN
MT 1099 REM OPEN HIGH HAT
FB 1100 POKE 53768,0
BF 1105 POKE 53760,0
OY 1110 FOR J=4 TO 0 STEP -0.2:POKE 53761
   ,128+J
NQ 1120 IF PEEK(764)<>255 THEN POP :RETUR
   N
GT 1130 NEXT J:RETURN
CZ 1199 REM CRASH CYMBAL
FD 1200 POKE 53768,0
BH 1205 POKE 53760,0
PY 1210 FOR J=6 TO 0 STEP -0.2:POKE 53761
   ,128+J
NS 1220 IF PEEK(764)<>255 THEN POP :RETUR
   N
GV 1230 NEXT J:RETURN
OY 1299 REM CRASH CYMBAL (LONG FADE)
FF 1300 POKE 53768,0
CA 1305 POKE 53760,1
PL 1310 FOR J=7 TO 0 STEP -0.1:POKE 53761
   ,128+J
NU 1320 IF PEEK(764)<>255 THEN POP :RETUR
   N
GX 1330 NEXT J:RETURN
AX 9999 REM DRUM DEMO
QT 10000 POKE 20,30
LY 10010 IF PEEK(20)>25 THEN POKE 20,0:GO
   SUB 100:GOTO 10010+20*STRIG(0)
EK 10015 IF PEEK(764)<>255 THEN RETURN
WD 10020 GOTO 10010
IW 10030 IF PEEK(20)>25 THEN POKE 20,0:GO
   SUB 200:GOTO 10010
ES 10035 IF PEEK(764)<>255 THEN RETURN
XP 10040 GOTO 10030
KK 30000 GRAPHICS 0:POKE 712,144:POKE 709
   ,12:POKE 710,144:POKE 711,150:POKE 752
   ,1
WB 30010 DIM KEY(63)
IF 30020 DL=PEEK(560)+256*PEEK(561):POKE
   DL+3,66:POKE DL+11,7:POKE DL+12,6
XC 30030 POKE DL+23,6:POKE DL+24,6:POKE D
   L+26,65:POKE DL+27,PEEK(560):POKE DL+2
   8,PEEK(561)
ZZ 30040 POSITION 7,1:? "Glenn Gutierrez
   presents"
OH 30050 POKE 708,15:POSITION 6,6:? #6;"S
   YNDRUM"
PD 30055 POSITION 26,6:? #6;"▸▸▸▸▸▸▸"
PW 30060 POSITION 10,12:? "Written on 8/1
   6/84"
KA 30070 POSITION 10,13:? "for ANTIC Maga
   zine"
SS 30075 RESTORE 31000:FOR J=0 TO 63:READ
    D:KEY(J)=D:NEXT J
VD 30080 POSITION 24,17:? "press start":P
   OSITION 14,18:? "or any key"
QI 30090 IF PEEK(53279)<>6 AND PEEK(764)=
   255 THEN 30090
HG 30100 POKE 764,255:RETURN
BH 31000 DATA 300,0,200,0,0,500,100,100,1
   200,0
ZJ 31001 DATA 1100,0,10000,1300,1000,400,
   750,0,750,0
GV 31002 DATA 0,800,700,700,0,0,0,0,0,0
XU 31003 DATA 0,0,850,0,900,800,0,850,900
   ,600
CA 31004 DATA 1200,0,1100,0,0,1300,1000,4
   00,0,0
BO 31005 DATA 0,0,0,0,0,0,300,0,200,0
YT 31006 DATA 0,500,100,100
```

# BEAT THE BEEPS

Article on page 33.

```
UU 10 REM BEET THE BEEPS
BI 20 REM BY IAN LOVEJOY
ZD 30 GRAPHICS 2:POKE 710,0:POSITION 2,3:
   ? #6;"BEAT the BEEPS!"
GU 40 POKE 755,0
CS 50 ? "           By Ian Lovejoy"
IE 60 FOR X=1 TO 1000:NEXT X:GRAPHICS 0
EE 70 ? "Filename conventions:":?
AN 80 ? " -Type 'C:' for cassette.":?
ZE 90 ? " -Type 'AUTORUN.SYS' for autoboo
   t"
UG 100 ? "  disk file.":?
AS 110 ? " -Type any other filename for a
   "
BX 120 ? "  binary load disk file.  (RUN
   with"
GY 130 ? "  DOS 2.0S Option 'L')":? :?
RC 140 PRINT ">INPUT FILENAME";:DIM FILE$
   (15),FIL$(15):INPUT FIL$
RE 150 IF FIL$="C:" THEN FILE$=FIL$:OPT=1
   28:? "Prepare your tape, press [RETURN
   ]":GOTO 190
EE 160 OPT=0
EI 170 IF FIL$(1,1)="D" AND (FIL$(2,2)=":
   " OR FIL$(3,3)=":") THEN FILE$=FIL$:GO
   TO 190
OW 180 FILE$(1,2)="D:":FILE$(3)=FIL$
MK 190 TRAP 240:CLOSE #1:OPEN #1,8,OPT,FI
   LE$
VD 200 IF OPT=0 THEN PUT #1,255:PUT #1,25
   5:PUT #1,0:PUT #1,6:PUT #1,255:PUT #1,
   6:RESTORE 260
VE 210 TRAP 220:READ A:PUT #1,A:GOTO 210
DR 220 IF OPT=0 THEN PUT #1,226:PUT #1,2:
   PUT #1,227:PUT #1,2:PUT #1,1:PUT #1,6
QN 230 CLOSE #1:IF PEEK(195)=6 THEN ? "DO
   NE":END
AG 240 ? "ERROR #";PEEK(195):? :STOP
QV 250 DATA 0,3,243,5,1,6,169,60,141,2,21
   1,24,96
PM 260 DATA 104,160,8,185,13,6,153,32,3,1
   36,208,247,96,69,37,6,83,16,228
PO 270 DATA 75,22,6,51,246,51,246,56,6,60
   ,246,51,246,60,246,76,228,243,251,243,
   51,246,204,6,163
RT 280 DATA 246,51,246,60,246,76,228,243,
   169,255,141,252,2,165,42,74,176,95,169
   ,128,166,17,240,85,173
NG 290 DATA 252,2,201,255,240,238,133,114
   ,162,255,142,252,2,170,224,192,144,2,1
   62,3,189,254,254,141,251
SG 300 DATA 2,201,128,240,209,201,129,208
   ,11,173,182,2,73,128,141,182,2,76,52,6
   ,201,130,208,7,169
ZE 310 DATA 0,141,190,2,240,183,201,131,2
   08,7,169,64,141,190,2,208,172,201,132,
   208,7,169,128,141,190
TT 320 DATA 2,208,161,201,133,208,10,169,
   136,133,76,133,17,169,155,208,38,165,1
   14,201,64,176,21,173,251
AT 330 DATA 2,201,97,144,14,201,123,176,1
   0,173,190,2,240,5,5,114,76,82,6,32,141
   ,252,240,9,173
YI 340 DATA 251,2,77,182,2,141,251,2,76,5
   2,246,32,179,252,32,136,250,165,107,24
   0,3,76,124,246,165
GA 350 DATA 84,133,108,165,85,133,109,32,
   57,6,132,76,173,251,2,201,155,208,3,76
   ,110,246,32,173,246
TI 360 DATA 32,179,252,76,226,6,0,0,0,0,0
   ,0
```

**assembly language**

# S.A.M. HANDLER

Article on page 63.

## LISTING 1

```
FB 5 REM THE SAM HANDLER
ZM 6 REM BY CHRIS BONE
QO 7 REM ANTIC MAGAZINE
IE 10 DATA 104,162,0,134,203,189,26,3,240
   ,9,201,86,240,25,232,232,232,208,242,1
   69,86
PN 20 DATA 157,26,3,169,40,157,27,3,169,6
   ,157,28,3,169,0,157,29,3,96,55,6
QA 30 DATA 125,6,54,6,58,6,55,6,54,6,76,5
   5,6,96,160,1,96,72,165,203,170
NS 40 DATA 104,201,155,208,17,169,46,157,
   20,32,232,169,155,157,20,32,76,111,6,1
   57,20
JF 50 DATA 32,201,44,208,6,157,20,32,232,
   169,32,157,20,32,232,138,133,203,201,2
   54,208
VH 60 DATA 17,169,155,157,20,32,32,11,32,
   169,155,141,20,32,169,0,133,203,160,1,
   96
LT 70 DATA 169,155,157,20,32,32,11,32,169
   ,155,141,20,32,169,0,133,203,160,1,96,
   0
GX 80 ? "ĸ":POSITION 13,10:? "LOADING HAN
   DLER"
UC 90 FOR A=1536 TO 1682
SQ 100 READ B
UI 110 POKE A,B
CT 120 NEXT A
YM 130 A=USR(1536)
UQ 140 ? "ĸ":POSITION 3,6:? "HANDLER NOW
   LOADED AND INITIALISED"
TQ 150 POSITION 3,8:? "IF YOU PRESS SYSTE
   M RESET YOU WILL "
VV 160 POSITION 7,10:? "NEED TO ENTER 'A=
   USR(1536)'"
PC 170 POSITION 2,12:? "AS A DIRECT COMMA
   ND TO REINITIALISE."
```

continued on next page

## LISTING 2

```
50        .OPT LIST
60 ;EQUATES
70 BUFFO =    $CB       ;BUFFER OFFSET IS
 A SAFE PAGE 0 LOCATION
80 BUFF  =    $2014     ;LOCATION OF SAM
BUFFER
90 EOL   =    $9B       ;END OF LINE CHAR
ACTER CODE
0100 SAYIT = $200B    ;RECITER ENTRY PO
INT
0110 HATABS = $031A   ;START OF HANDLER
 TABLE
0120 ;THIS IS IT
0130 ;INSTALLATION ROUTINE
0140 ;LOCATED IN PAGE 6
0150      *=   $0600
0160 HANDLOAD
0170      PLA           ;REMOVE UNUSED BA
SIC ARGUMENT
0180      LDX #0        ;START AT THE BEG
INNING
0190      STX BUFFO     ;MARK BUFFER EMPT
Y
0200 SEARCH
0210      LDA HATABS,X ;CHECK DEVICE NA
ME
0220      BEQ NOMORE   ;LAST ENTRY?
0230      CMP #'V      ;IS HANDLER ALREA
DY INSTALLED?
0240      BEQ END      ;YES, SO QUIT
0250      INX
0260      INX
0270      INX          ;NEXT ENTRY
0280      BNE SEARCH
0290 NOMORE ;          LOAD HANDLER
0300      LDA #'V      ;DEVICE NAME, "V:
"(VOICE)
0310      STA HATABS,X ;TO HANDLER TABL
E
0320      LDA # <SAMHAND ;LSB OF VECTOR
 ADDRESS
0330      STA HATABS+1,X
0340      LDA # >SAMHAND ;MSB OF VECTOR
 ADDRESS
0350      STA HATABS+2,X
0360      LDA #0
0370      STA HATABS+3,X ;ENSURE CORREC
T END OF TABLE
0380 END RTS
0390 ;HANDLER TABLE UPDATED
0400 ;IN ORDER TO USE, AFTER RESET SAY
,
0410 ;USE "A=USR(1536)"
0420      .PAGE "THIS IS SAM HANDLER"
0430 SAMHAND
0440      .WORD VOPEN-1
0450      .WORD VCLOSE-1
0460      .WORD VGETB-1 ;IMPOSSIBLE, BU
T A VECTOR IS REQUIRED
0470      .WORD VPUTB-1
0480      .WORD VSTATUS-1
0490      .WORD VXIO-1
0500      JMP VXIO      ;FOR SAFETY!
0510 VXIO ;             ERROR IT
0520 VGETB RTS          ;CANNOT BE DONE
0530 VOPEN ;            DO NOTHING BUT TE
LL
0540 VSTATUS ;          O.S. THAT EVERYTH
ING O.K.
0550      LDY #1        ;IF THEY ARE CALL
ED
0560      RTS           ;THEY SIGNAL SUCC
ESS!
0570 VPUTB
0580      PHA           ;SAVE DATA BYTE
0590      LDA BUFFO
0600      TAX           ;BUFFER OFFSET IN
 X
0610      PLA
0620      CMP #EOL      ;IS IT AN END OF
LINE
0630      BNE NEXT      ;NO
0640      LDA #'.       ;YES, SO SEND A
0650      STA BUFF,X    ;PERIOD FOR INFLE
CTION
0660      INX
0670      LDA #EOL      ;AND THEN SEND TH
E
0680      STA BUFF,X    ;END OF LINE
0690      JMP SPEAK     ;AND SAY IT
0700      STA BUFF,X
0710 NEXT CMP #',       ;IS IT A COMMA?
0720      BNE NEXT1     ;NO
0730      STA BUFF,X    ;YES SO SEND IT,
0740      INX
0750      LDA #$20      ;AND A SPACE.
0760 NEXT1 STA BUFF,X
0770      INX
0780      TXA
0790      STA BUFFO     ;INCREMENT BUFFER
 OFFSET
0800      CMP #$FE      ;BUFFER FULL?
0810      BNE NOTFULL
0820      LDA #EOL      ;BUFFER FULL SO S
END EOL
0830      STA BUFF,X    ;TO BUFFER AND SA
Y IT.
0840 SPEAK
0850      JSR SAYIT
0860      LDA #EOL
0870      STA BUFF      ;EMPTY BUFFER
0880      LDA #0
0890      STA BUFFO     ;MARK BUFFER EMPT
Y
0900 NOTFULL LDY $01 ;MARK SUCCESS
0910      RTS
0920 ;AND THAT'S IT!
0930 VCLOSE
0940      LDA #EOL
0950      STA BUFF,X
0960      JSR SAYIT     ;ON CLOSE, SPEAK
WHAT ID IN BUFFER
0970      LDA #EOL
0980      STA BUFF      ;EMPTY BUFFER
0990      LDA #0
1000      STA BUFFO     ;MARK BUFFER EMPT
Y
1010      LDY #1        ;SIGNAL SUCCESS
1020      RTS
```

# TECH TIPS

These instructions let you use filenames with numbers, punctuation marks and lowercase letters with DOS 2.0S. To make the changes permanent, type [H] to WRITE NEW DOS FILES when the DOS menu appears.

POKE 3818,33:POKE 3822,123:DOS

Typing X=USR(3352) will format your disk from BASIC.

This routine uses the Atari's realtime clocks to keep track of elapsed seconds:

```
10 POKE 18,0:POKE 19,0:POKE 20,0
20 TIMER=INT((PEEK(18)*65536+PEEK(19)*
256+PEEK(20))/60+0.5)
```

# KOOKY'S QUEST

Article on page 56.

```
EH 10 REM KOOKY'S QUEST
IS 20 REM BY
WZ 30 REM ANSCHUETZ/WEISGERBER/ANSCHUETZ
RI 40 REM ANTIC MAGAZINE
EK 100 GRAPHICS 18:POKE 16,64:POKE 53774,
   64:DL=PEEK(560)+256*PEEK(561):SETCOLOR
    2,0,0
CL 110 POKE DL+10,6:POKE DL+11,6:POKE DL+
   12,6:POKE DL+13,2:SETCOLOR 0,8,4:POSIT
   ION 4,4
WH 120 ? #6;"KOOKY'S QUEST":POSITION 5,8:
   ? #6;"ANSCHUETZ/WEISGERBER/ANSCHUETZ"
OD 130 POSITION 0,6:? #6;"press start to 
   begin":IF PEEK(53279)<>6 THEN 130
HP 140 DIM A$(25),B$(25):GRAPHICS 0:POKE
   16,64:POKE 53774,64:POKE 752,1:SETCOLO
   R 2,0,2:SETCOLOR 4,0,2
QH 150 A$="<↓←<↓←<↓← ↓← ↓← ↓←<↓←<↓←<":B$=
   " ↓← ↓← ↓← ↓← ↓← ↓← ↓← ↓← "
SL 160 DIM OHP(6,6),MON$(6),CON$(6),T$(2)
   ,WEP$(12):MON$="^;(/:\":CON$="[      ":
   T$="]_":WEP$="ghefcdabijkl"
SJ 170 FOR R=1 TO 6:FOR C=1 TO 6:READ A:O
   HP(R,C)=A:NEXT C:NEXT R
SZ 180 DIM F$(16):F$="<↓←<↓←<↓←<↓←<↓←<"
SZ 190 DIM G$(25),H$(25):G$="<↓←<↓←<↓←<↓←
   <↓←<↓←<↓←<↓←<":H$="<↓← ↓← ↓← ↓← ↓← ↓←
   ↓← ↓←<"
DI 200 DATA 30,15,10,6,5,7.5,10,30,15,5,7
   .5,6,15,10,30,7.5,6,5,5,7.5,6,15,30,10
   ,7.5,6,5,10,15,30,6,5,7.5,30,10,15
NI 210 DATA 0,0,64,248,64,0,0,0
DB 220 DATA 0,0,2,31,2,0,0,0
QJ 230 DATA 0,27,10,254,10,27,0,0
MS 240 DATA 0,216,80,127,80,216,0,0
OY 250 DATA 0,31,14,254,14,31,0,0
JE 260 DATA 0,248,112,127,112,248,0,0
NA 270 DATA 0,64,96,255,96,64,0,0
MH 280 DATA 0,2,6,255,6,2,0,0
GS 290 DATA 0,0,63,24,252,0,0,0
GI 300 DATA 0,0,252,24,63,0,0,0
ED 310 DATA 0,40,18,92,58,72,20,0
FD 320 DATA 0,20,72,58,92,18,40,0
ED 330 DATA 255,135,219,219,219,219,135,2
   55
RV 340 DATA 126,255,255,231,231,255,255,1
   26
SK 350 DATA 60,24,36,66,66,36,24,0
KZ 360 DATA 85,85,85,85,85,85,85,85
MD 370 DATA 254,254,254,0,239,239,239,0
OY 380 DATA 0,126,219,255,189,195,126,0
PB 390 DATA 255,231,195,195,231,231,231,2
   55
LB 400 DATA 255,219,147,219,219,219,193,2
   55
DM 410 DATA 126,255,255,255,255,255,255,1
   26
NB 420 DATA 73,114,149,12,126,146,34,85
OU 430 DATA 28,62,42,28,42,34,85,85
HM 440 DATA 36,219,126,66,255,165,36,231
VY 450 DATA 0,0,219,126,24,36,0,0
RK 460 DATA 240,80,248,30,7,33,67,62
SI 470 DATA 0,28,42,28,73,62,8,54
DV 480 DATA 124,84,124,40,254,56,124,238
TM 490 DATA 0,0,192,224,191,234,192,0
MP 500 DATA 60,66,129,255,165,165,255,0
DD 510 DATA 170,170,170,170,170,170,170,1
   70
RG 520 ? "↰"
BB 530 DIM CHA$(31):CHA$="abcdefghijkl*+_
   @<>%&#[^;:/\()]?":CHS=(PEEK(106)-8)*25
   6
SW 540 PM=(PEEK(106)-12)*256:IF PEEK(CHS+
   9)<>0 THEN 590
TB 545 ? :? :? "     One moment please..."
   :FOR X=1 TO 700:NEXT X:? "↰":POKE 559,
   0
LH 550 FOR I=0 TO 1023:POKE CHS+I,PEEK(57
   344+I):NEXT I:FOR I=1 TO 31:CHP=CHS+(A
   SC(CHA$(I))-32)*8
PZ 560 IF I<13 THEN CHP=CHP+256
JO 570 FOR J=0 TO 7:READ A:POKE CHP+J,A:N
   EXT J:NEXT I
TL 580 FOR X=PM+64 TO PM+128:POKE X,255:N
   EXT X
PO 590 POKE 53277,3:POKE 54279,PM/256-4:P
   OKE 623,1:POKE 53256,3:POSITION 2,12:P
   OKE 559,62
BL 600 OPEN #1,4,0,"K:":? "→→→→SKILL - EX
   PERT OR BEGINNER";:GET #1,K:IF K<>69 A
   ND K<>66 THEN CLOSE #1:? "↑":GOTO 600
BE 610 ? "↰":POKE 559,0:POKE 704,2:P=188:
   SC=PEEK(88)+256*PEEK(89):L=1:X=30:X1=S
   C+472:LI=10:RL=7
DF 620 MO1=4:MO2=12:Q=1:ST=23:TS=15:POKE
   82,0
TS 630 POKE 756,CHS/256:GOSUB 1870
UX 640 POSITION 4,3:? "KOOKY'S↓←←←←←←QUES
   T":POSITION 1,6:? "SCORE=0↓↓←←←←←←←←LIV
   ES=10↓↓←←←←←←←←←LEVEL=1"
PP 650 POSITION 1,12:? "TREASURES=0"
TR 660 FOR Y=18 TO 21:POSITION 0,Y:? "<<<
   <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<"
   ;:NEXT Y
YD 670 POSITION 27,3:? "??????????":POSIT
   ION 27,12:? "??????????"
GA 680 FOR R=4 TO 11:POSITION 27,R:? "?":
   POSITION 36,R:? "?":NEXT R
EJ 690 POSITION 5,19:? "1 SWORD    3 MACE
       5 L.BOLT  ":POSITION 5,20:? "2 AXE
       4 KNIFE    6 FIREBALL"
RR 700 POSITION 14,3:? "eeeeeeeeeee":POSI
   TION 14,13:? "eeeeeeeeeee":FOR R=4 TO
   12:POSITION 14,R:? "e":POSITION 24,R
DJ 710 ? "e":NEXT R:FOR R=4 TO 6:POSITION
    15,R:? "<<<    <<<":POSITION 15,R+6:?
   "<<<<<<<<<":NEXT R
NB 720 N=PEEK(X1):POKE X1,N+128:POSITION
   2,0:? " ":POKE 704,42*(K=69)+132*(K=66
   ):POKE 559,62:POKE 53248,160
GI 730 J=STICK(0)
AU 740 IF  NOT (CR=RL AND ((DMT<5 AND L>1
   ) OR (DMT<1 AND L=1))) THEN 760
PO 750 POSITION 4,16:? "YOU WILL WANDER L
   EVEL ";L;" FOREVER":FOR MIAD=0 TO 0 ST
   EP 0:NEXT MIAD
OC 760 IF J=14 AND (N=65 OR N=67 OR N=68
   OR N=88 OR N=90 OR N=83 OR N=124 OR N<
   11) THEN ST=1:A=7:A1=9:GOTO 820
JD 770 IF J=13 AND (N=65 OR N=81 OR N=68
   OR N=69 OR N=87 OR N=83 OR N=124 OR N<
   11) THEN ST=-1:A=9:A1=7:GOTO 820
DP 780 IF J=7 AND (N=65 OR N=81 OR N=87 O
   R N=82 OR N=88 OR N=90 OR N=83) THEN S
   T=-1:A=20:A1=18:GOTO 1020
```

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GW 790 IF J=11 AND (N=67 OR N=68 OR N=69
   OR N=87 OR N=82 OR N=88 OR N=83) THEN
   ST=1:A=18:A1=20:GOTO 1020
ZZ 800 IF N=6 OR N=10 THEN 2060
PE 810 GOTO 730
TX 820 V=ST*3:POKE X1,N
XM 830 IF N=124 OR N=6 OR N=10 THEN 850
LN 840 GOSUB 950*(N=69 OR N=68 OR N=67)+9
   80*(N=65 OR N=90 OR N=81)+1000*(N=83 O
   R N=87 OR N=88)
VF 850 A=A-V:A1=A1-V:X1=X1-ST*40:N=PEEK(X
   1):POKE X1,N+128
LQ 860 IF N=65 THEN 1890
HO 870 IF N=68 THEN 1910
AO 880 IF N=67 OR N=69 THEN 1930
EF 890 IF N=87 OR N=88 THEN 1950
YA 900 IF N=81 OR N=90 THEN 1970
LY 910 IF N=83 THEN 1990
UN 920 IF N=3 OR N=11 THEN 2010
AG 930 IF N=6 OR N=10 THEN 2060
XL 940 POKE 77,0:GOTO 730
HK 950 FOR W=A TO A1 STEP ST:POSITION 15,
   W:? "<<<":POSITION 15,W+V:? "     ":N
   EXT W
UH 960 FOR W=A TO A1 STEP ST:POSITION 15,
   W+V:? "<<<":NEXT W:RETURN
PR 970 GOTO 730
KD 980 FOR W=A TO A1 STEP ST:POSITION 21,
   W:? "<<<":POSITION 18,W+V:? "     ":N
   EXT W
QF 990 FOR W=A TO A1 STEP ST:POSITION 21,
   W+V:? "<<<":NEXT W:RETURN
IH 1000 FOR W=A TO A1 STEP ST:POSITION 15
   ,W:? "<<<   <<<":POSITION 15,W+V:? "
        ":NEXT W
YC 1010 FOR W=A TO A1 STEP ST:POSITION 15
   ,W+V:? "<<<   <<<":NEXT W:RETURN
RB 1020 V=ST*3:POKE X1,N
HF 1030 DQ=2050*(N=65 OR N=68 OR N=83)+21

   00*(N=67 OR N=88 OR N=90)+2150*(N=69 O
   R N=87 OR N=81)
JM 1040 IF N<>82 THEN GOSUB 1140*(N=65 OR
    N=68 OR N=83)+1160*(N=67 OR N=88 OR N
   =90)+1180*(N=69 OR N=87 OR N=81)
SU 1050 A=A-V:A1=A1-V:X1=X1-ST:N=PEEK(X1)
   :POKE X1,N+128
ZI 1060 IF N=88 THEN 2130
YT 1070 IF N=83 THEN 2150
HD 1080 IF N=90 OR N=67 THEN 2170
LH 1090 IF N=65 OR N=68 THEN 2190
AK 1100 IF N=69 OR N=81 THEN 2210
ZD 1110 IF N=87 THEN 2230
KU 1120 IF N=3 OR N=11 THEN 2250
VY 1130 POKE 77,0:GOTO 730
NP 1140 FOR W=A TO A1 STEP ST:POSITION W+
   V,4:? B$:POSITION W,4:? A$:NEXT W
GZ 1150 FOR W=A TO A1 STEP ST:POSITION W+
   V,4:? A$:NEXT W:RETURN
DC 1160 FOR W=A TO A1 STEP ST:POSITION W+
   V,4:? B$(10):POSITION W,4:? G$(19):NEX
   T W
FS 1170 FOR W=A TO A1 STEP ST:POSITION W+
   V,4:? G$(19):NEXT W:RETURN
ZF 1180 FOR W=A TO A1 STEP ST:POSITION W+
   V,7:? B$(10):POSITION W,10:? G$(19):NE
   XT W
FS 1190 FOR W=A TO A1 STEP ST:POSITION W+
   V,10:? G$(19):NEXT W:RETURN
GG 1200 QP=0:DM=0:GOTO 1210
QC 1210 Z=INT(RND(0)*2):M3=16+6*Z:MM3=8:D
   M=0:MON=INT(RND(1)*5)+2:KX=19:KY=8:THP
   =0:IF L=5 THEN MON=1
WP 1220 TX=INT(RND(0)*7)+16:TY=INT(RND(0)
   *7)+5:TY=TY+(TY=8):POSITION TX,TY:? T$
   (Z+1,Z+1)
AM 1230 IF L=1 AND X1=SC+428 THEN POSITIO
   N 19,5:? "%"
KT 1240 IF L=5 AND X1=SC+195 THEN POSITIO
   N 19,5:? ")"
XI 1250 POSITION M3,MM3:? MON$(MON,MON):P
   OSITION KX,KY:? ">"
QA 1260 POSITION 10,16:? "CHOOSE YOUR WEA
   PON!";:GET #1,OWEP:OWEP=OWEP-48:POSITI
   ON 10,16:? "                         "
IL 1270 IF OWEP>6 OR OWEP<1 THEN 1260
AI 1280 MIAD=1^1^1:HP=OHP(MON,OWEP):OWEP=
   OWEP*2-1
SW 1290 POSITION M3,MM3:? CON$(MON,MON):B
   C=INT(2*RND(0)+1):CB=INT(2*RND(0)+1)
RX 1300 POSITION M3,MM3:? CON$(MON,MON):B
   C=INT(2*RND(0)+1):CB=INT(2*RND(0)+1)
RJ 1310 M3=M3+(BC=1)*(M3<22)-(BC=2)*(M3>1
   6)
LE 1320 MM3=MM3+(CB=1)*(MM3<11)-(CB=2)*(M
   M3>5)
EM 1330 POSITION WX,KY:? " ":WX=WX*JW
ID 1340 POSITION M3,MM3:? MON$(MON,MON)
OD 1350 J=STICK(0)
UO 1360 IF STRIG(0)=0 OR JW=1 THEN 1480
KX 1370 IF J=14 THEN POSITION KX,KY:? " "
   :KY=KY-1
HC 1380 IF J=13 THEN POSITION KX,KY:? " "
   :KY=KY+1
CT 1390 IF J=7 THEN POSITION KX,KY:? " ":
   KX=KX+1
FN 1400 IF J=11 THEN POSITION KX,KY:? " "
   :KX=KX-1
CD 1410 PE=PEEK(SC+KX+KY*40):IF PE=61 OR
   PE=63 THEN SOUND 0,18,10,10:DMT=DMT+1^
   1:SOUND 0,0,0,0:PT=PT+5:GOTO 1460
FS 1420 IF PE=9 THEN SOUND 0,18,10,10:KEY
   =1^1:SOUND 0,0,0,0:GOTO 1460
MW 1430 IF PE=5 AND KEY THEN POSITION 4,1
   6:? "YOU HAVE ESCAPED THE DUNGEON!!!":
   FOR MIAD=0 TO 0 STEP 0:NEXT MIAD
HX 1440 IF PE=5 THEN 1460
CU 1450 IF PE>0 AND PE<>30 THEN SOUND 0,1
   0,100,10:LI=LI-1:GOTO 1660
DV 1460 POSITION KX,KY:? ">"
TC 1470 GOTO 1290
OO 1480 J=STICK(0)
GX 1490 WEP=OWEP:PE=PEEK(SC+KX+KY*40):IF
   PE>0 AND PE<>30 THEN SOUND 0,10,100,10
   :LI=LI-1:GOTO 1660
DV 1500 IF OWEP>6 THEN 1550
XB 1510 JW=0
PU 1520 IF J=7 AND KX<22 THEN WX=KX+1:GOT
   O 1620
JJ 1530 IF J=11 AND KX>16 THEN WEP=WEP+1:
   WX=KX-1:GOTO 1620
SV 1540 GOTO 1290
OH 1550 IF JW=1 THEN 1590
NG 1560 IF J=7 AND KX<22 THEN RA=1:WX=KX:
   GOTO 1610
PJ 1570 IF J=11 AND KX>16 THEN RA=-1:WX=K
   X:GOTO 1610
TH 1580 GOTO 1290
ZX 1590 PE1=PEEK(SC+WX+KY*40):IF PE1=61 O
   R PE1=63 OR PE1=59 THEN WX=0:JW=0:GOTO
    1290
EJ 1600 IF PE1>0 THEN SOUND 0,16,14,10:JW
   =0:THP=THP+HP*1^1:SOUND 0,0,0,0:IF THP
   =30 THEN PT=PT+10:GOTO 1660
EV 1610 WEP=WEP+(RA=-1):WX=WX+RA*(WX<23)*
   (WX>15):JW=(WX<22)*(WX>16)
ZE 1620 PE1=PEEK(SC+WX+KY*40):IF PE1=61 O
   R PE1=63 OR PE1=59 THEN WX=0:JW=0:GOTO
    1290
ES 1630 IF PE1>0 THEN SOUND 0,16,14,10:JW
   =0:THP=THP+HP*1^1:SOUND 0,0,0,0:IF THP
   =30 THEN PT=PT+10:GOTO 1660
XR 1640 POSITION WX,KY:? WEP$(WEP,WEP)
TA 1650 GOTO 1290
CN 1660 FOR W=5 TO 11:POSITION 16,W:? "
         ":NEXT W:POSITION 7,8:? LI;" ":SO
   UND 0,0,0,0:CR=CR+1:POSITION 7,6:? PT
KP 1670 POSITION 11,12:? DMT
FG 1680 IF LI<1 THEN POSITION 15,15:? "GA
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   ME OVER":POSITION 7,16:? "PRESS BUTTON
    TO PLAY AGAIN":GOTO 2400
CY 1690 J=STICK(0):UP=PEEK(X1-40):DO=PEEK
   (X1+40):FO=PEEK(X1+1):BA=PEEK(X1-1)
QR 1700 IF J=14 AND (UP=65 OR UP=81 OR UP
   =68 OR UP=69 OR UP=87 OR UP=83 OR UP=1
   24) THEN OW=1:ST=1:GOTO 1750
DS 1710 IF J=13 AND (DO=65 OR DO=67 OR DO
   =68 OR DO=88 OR DO=90 OR DO=83 OR DO=1
   24) THEN OW=2:ST=-1:GOTO 1750
DA 1720 IF J=11 AND (BA=65 OR BA=81 OR BA
   =87 OR BA=82 OR BA=88 OR BA=90 OR BA=8
   3) THEN OW=3:ST=1:GOTO 1810
ZI 1730 IF J=7 AND (FO=67 OR FO=68 OR FO=
   69 OR FO=87 OR FO=82 OR FO=88 OR FO=83
   ) THEN OW=4:ST=-1:GOTO 1810
UV 1740 GOTO 1690
NS 1750 IF OW=1 THEN A=4:A1=11
SH 1760 IF OW=2 THEN A=12:A1=5
VO 1770 POSITION 16,A1+ST:? "           ":FOR
    W=A TO A1 STEP ST:POSITION 15,W:? "<<
   <   <<<":POSITION 15,W+ST
TJ 1780 ? "<<<<<<<<<":NEXT W
BI 1790 POSITION 15,A1+ST:? "<<<   <<<"
AY 1800 V=3*ST:A=7*(OW=1)+9*(OW=2):A1=9*(
   OW=1)+7*(OW=2):POKE X1,11:GOTO 850
TN 1810 IF OW=3 THEN A=15:A1=22
WM 1820 IF OW=4 THEN A=23:A1=16
WC 1830 POSITION A1+ST,4:? H$
SA 1840 FOR W=A TO A1 STEP ST:POSITION W,
   4:? A$
HB 1850 POSITION W+ST,4:? G$:NEXT W:POSIT
   ION A1+ST,7:? B$(19)
RC 1860 V=3*ST:A=18*(OW=3)+20*(OW=4):A1=2
   0*(OW=3)+18*(OW=4):POKE X1,11:GOTO 105
   0
MU 1870 RESTORE 2300+(L-1)*20
KM 1880 FOR P=SC+188 TO SC+468 STEP 40:FO
   R RT=P TO P+7:READ M:POKE RT,M:NEXT RT
   :NEXT P:RETURN
TC 1890 FOR W=A TO A1 STEP ST:POSITION 21
   ,W:? "   ":NEXT W
IV 1900 FOR W=A TO A1 STEP ST:POSITION 21
   ,W:? "<<<":POSITION 21,W+V:? "   ":NEX
   T W:GOTO 730
WR 1910 FOR W=A TO A1 STEP ST:POSITION 15
   ,W:? "   ":NEXT W
UL 1920 FOR W=A TO A1 STEP ST:POSITION 15
   ,W:? "<<<":POSITION 15,W+V:? "   ":NEX
   T W:GOTO 730
WX 1930 FOR W=A TO A1 STEP ST:POSITION 15
   ,W:? "   ":NEXT W
WQ 1940 FOR W=A TO A1 STEP ST:POSITION 15
   ,W:? "<<<<<<":POSITION 15,W+V:? "     ":
   NEXT W:GOTO 730
YJ 1950 FOR W=A TO A1 STEP ST:POSITION 15
   ,W:? "         ":NEXT W
GX 1960 FOR W=A TO A1 STEP ST:POSITION 15
   ,W:? "<<<<<<<<<":POSITION 15,W+V:? "
        ":NEXT W:GOTO 730
SY 1970 FOR W=A TO A1 STEP ST:POSITION 21
   ,W:? "   ":NEXT W
UE 1980 FOR W=A TO A1 STEP ST:POSITION 18
   ,W:? "<<<<<<":POSITION 21,W+V:? "     ":
   NEXT W:GOTO 730
YV 1990 FOR W=A TO A1 STEP ST:POSITION 15
   ,W:? "         ":NEXT W
DG 2000 FOR W=A TO A1 STEP ST:POSITION 15
   ,W:? "<<<   <<<":POSITION 15,W+V:? "
        ":NEXT W:GOTO 730
JZ 2010 POSITION 15,A:? "<<<<<<<<<"
LQ 2020 A1=11*(ST=1)+5*(ST=-1)
AY 2030 FOR W=A TO A1 STEP ST:POSITION 15
   ,W:? "<       <":POSITION 15,W+ST:? "<
   <<<<<<<<":NEXT W
CL 2040 POSITION 15,A:? "<<<<<<<<<":IF N=
   3 THEN QP=0:DM=0:GOTO 1210
UL 2050 GOTO 1690
BD 2060 IF (L>1 AND DMT<5) OR (L=1 AND DM
   T<1) THEN 730
AB 2070 CR=0:PT=PT+50:IF N=6 THEN L=L-1:D
   MT=0:N=10:GOTO 2100
GK 2080 IF N=10 THEN L=L+1:DMT=0:N=6
QM 2090 FOR S=16 TO 32 STEP 4:SOUND 0,S,1
   4,10:DL=EA*EA*EA:SOUND 0,0,0,0:EA=1^0:
   NEXT S:GOTO 2110
NH 2110 RL=7*(L=1)+9*(L=2)+15*(L=3)+15*(L
   =4)+12*(L=5):POSITION 7,10:? L:POSITIO
   N 11,12:? "0 "
JG 2120 GOSUB 1870:GOTO 730
UC 2130 FOR W=A TO A1 STEP ST:POSITION W,
   4:? B$(19):NEXT W
RS 2140 FOR W=A TO A1 STEP ST:POSITION W+
   V,4:? B$(19):POSITION W,4:? G$(19):NEX
   T W:GOTO 730
ZJ 2150 FOR W=A TO A1 STEP ST:POSITION W,
   4:? B$:NEXT W
WI 2160 FOR W=A TO A1 STEP ST:POSITION W+
   V,4:? B$:POSITION W,4:? A$:NEXT W:GOTO
    730
UO 2170 FOR W=A TO A1 STEP ST:POSITION W,
   4:? B$(19):NEXT W
WI 2180 FOR W=A TO A1 STEP ST:POSITION W+
   V,4:? B$(19):POSITION W,4:? F$:NEXT W:
   GOTO 730
ZV 2190 FOR W=A TO A1 STEP ST:POSITION W,
   4:? B$:NEXT W
KG 2200 FOR W=A TO A1 STEP ST:POSITION W+
   V,4:? B$:POSITION W,4:? G$:NEXT W:GOTO
    730
IE 2210 FOR W=A TO A1 STEP ST:POSITION W,
   7:? B$(10):NEXT W
UT 2220 FOR W=A TO A1 STEP ST:POSITION W+
   V,R:? B$(10):POSITION W,R:? F$:NEXT W:
   GOTO 730
VP 2230 FOR W=A TO A1 STEP ST:POSITION W,
   10:? B$(19):NEXT W
GH 2240 FOR W=A TO A1 STEP ST:POSITION W+
   V,10:? B$(19):POSITION W,10:? G$(19):N
   EXT W:GOTO 730
XB 2250 POSITION A,4:? G$
QS 2260 A1=22*(ST=1)+16*(ST=-1)
DN 2270 FOR W=A TO A1 STEP ST:POSITION W,
   4:? H$
IU 2280 POSITION W+ST,4:? G$:NEXT W:POSIT
   ION A,4:? G$:IF N=3 THEN QP=0:DM=0:GOT
   O 1210
VB 2290 GOTO 1690
WQ 2300 DATA 0,3,87,82,87,82,82,69,81,68,
   65,69,90,3,69,124,124,10,124,124,81,82
   ,88,3,90,88,67,3,68,81,82,69,81,87
LZ 2310 DATA 82,69,90,67,81,67,90,83,82,8
   8,82,87,88,69,3,124,81,3,87,3,69,124,9
   0,88,88,82,88,82,88,67
RT 2320 DATA 81,87,3,81,3,87,87,69,65,68,
   124,124,65,68,3,124,124,6,124,65,3,90,
   83,67,3,67,65,68,65,87,67,3,90,82
VC 2330 DATA 67,90,3,124,81,68,81,87,82,8
   7,88,67,124,10,124,3,82,3,69,81,68,124
   ,90,88,82,88,88,67,90,67,
GS 2340 DATA 81,3,87,3,87,87,87,3,10,65,8
   3,87,67,3,67,124,65,83,3,88,69,124,81,
   3,3,67,124,81,3,68,65,69,0,81,88,68
XR 2350 DATA 90,83,83,68,3,83,87,3,69,3,6
   7,6,0,124,90,83,88,67,81,68,3,88,3,88,
   3,82,67,3
US 2360 DATA 81,3,69,3,81,3,87,69,6,90,83
   ,83,88,67,65,3,90,3,67,65,82,3,90,69,8
   1,69,81,3,69,90,87,3,3,68,65,67,124
SQ 2370 DATA 81,88,68,65,67,3,87,3,88,87,
   3,10,81,67,124,65,69,65,68,90,3,82,3,6
   7,90,3,67
TH 2380 DATA 81,87,82,82,82,82,69,3,90,3,
   81,3,69,3,90,67,81,67,124,81,83,88,82,
   3,3,81,68,3,124,3,82,67,90,88,67,65
UD 2390 DATA 67,124,81,3,81,69,0,90,69,65
   ,88,68,6,65,3,81,3,65,3,124,90,67,90,8
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   8,82,88,82,67
RP 2400 IF STRIG(0)<>0 THEN 2400
TB 2410 POKE 704,PEEK(710):POKE 53277,0:R
   UN
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education

# MUSIC FLASHCARDS

Article on page 66.

```
SF 10 REM MUSIC FLASHCARDS
UM 20 REM BY JAMES W. BROWN
RH 30 REM ANTIC MAGAZINE
IC 100 DIM INOTE(23),CNOTE$(23),KCODE(23)
ZX 110 DIM N$(1),RNG$(1)
NK 115 REM TITLE SCREEN
SY 120 GRAPHICS 1
MW 121 SETCOLOR 0,4,6:SETCOLOR 1,8,6:SETC
   OLOR 2,0,12:SETCOLOR 3,12,6
EG 123 POSITION 0,1:? #6;"*◣▣◥*◣▣◥*◣▣◥*◣▣
   ◥*◣▣◥"
LR 124 POSITION 0,2:? #6;"◥
          *"
ST 125 POSITION 0,3:? #6;"▣ MuSiC fLaShCa
   RdS ◣"
CU 127 POSITION 0,4:? #6;"◣
          ▣"
OB 130 POSITION 0,5:? #6;"*           bY
          ◥"
NZ 132 POSITION 0,6:? #6;"◥
          *"
TU 135 POSITION 0,7:? #6;"▣  JaMeS w. BrO
   WN  ◣"
FI 137 POSITION 0,8:? #6;"◣
          ▣"
JL 140 POSITION 0,9:? #6;"*           1▌8▖
          ◥"
DW 141 REM ASTER,7 SPACES,CTRL-Y,INV 8,IN
   V-CTRL-S,7 SPACES,INV-CTRL-J
HQ 142 POSITION 0,10:? #6;"◥
           *"
LD 144 POSITION 0,11:? #6;"▣
           ◣"
TN 145 POSITION 0,12:? #6;"▣◣*◥▣◣*◥▣◣*◥▣◣
   *◥▣◣*◥"
EI 200 REM SET UP NOTE VALUES
UZ 205 RESTORE 1000
TD 210 FOR I=1 TO 23
XL 215 READ N:INOTE(I)=N:NEXT I
TF 220 FOR I=1 TO 23
CA 225 READ N$:CNOTE$(I,I)=N$:NEXT I
TH 230 FOR I=1 TO 23
JU 235 READ N:KCODE(I)=N:NEXT I
EA 236 FOR J=23 TO 1 STEP -1:SOUND 0,INOT
   E(J),10,8:FOR D=1 TO 50:NEXT D:GOSUB 5
   00:NEXT J
QJ 238 FOR J=1 TO 21:SOUND 0,INOTE(J),10,
   8:FOR D=1 TO 50:NEXT D:GOSUB 500:NEXT
   J
MC 240 CH=764:REM KEYCODE BUFFER
VK 245 CRSINH=752:SHFLOK=702:OLDSCOR=-1
GT 249 REM START MAIN LOOP
AD 250 DEL=50:MAXTIM=100:SCORE=0
RC 255 POKE CRSINH,1
XN 260 ? "How many notes do you want";:GO
   SUB 1500
CO 265 TRAP 1265:INPUT NRNDS:TRAP 40000
NE 267 IF NRNDS<1 THEN 260
VY 269 GRAPHICS 0:POKE SHFLOK,64
IG 270 ? :? "Enter  G  for treble (G clef
   ) only."
PC 275 ? :? "Enter  F  for bass (F clef)
   only."
OE 277 ? :? "Enter  S  for whole staff."
SG 280 GOSUB 1500:TRAP 1280:INPUT RNG$:TR
   AP 40000
WA 285 IF RNG$<>"S" AND RNG$<>"F" AND RNG
   $<>"G" THEN 270
EF 299 REM DRAW STAFF
ZE 300 GRAPHICS 7:COLOR 1
FA 301 SETCOLOR 0,10,8:REM STAFF
ZP 302 SETCOLOR 1,7,10:REM NOTE (AND TEXT
    LUMINANCE)
FV 303 SETCOLOR 2,8,2:REM TEXT WINDOW
WM 304 SETCOLOR 4,8,2:REM BACKGROUND
PQ 305 FOR CLEF=1 TO 2
WQ 310 FOR LINE=1 TO 5
BB 315 Y=6*LINE+36*CLEF-32
RH 320 PLOT 1,Y:DRAWTO 159,Y
FA 325 NEXT LINE
ZK 327 NEXT CLEF
JJ 330 RESTORE 1050:READ X,Y:PLOT X,Y
UN 340 FOR POINT=1 TO 14
BC 345 READ X,Y:DRAWTO X,Y
EE 350 NEXT POINT
KE 360 RESTORE 1060:READ X,Y:PLOT X,Y
VG 365 FOR POINT=1 TO 14
AT 370 READ X,Y:DRAWTO X,Y
EX 375 NEXT POINT
ZL 380 PLOT 28,49:PLOT 28,55
RJ 385 POKE CRSINH,1
HI 400 FOR ROUND=1 TO NRNDS
HN 402 REM PICK A NOTE AND SHOW IT
TF 405 N=1+INT(RND(0)*23):SOUND 0,0,0,0
CQ 406 IF RNG$="F" AND N<14 THEN 405
EB 407 IF RNG$="G" AND N>13 THEN 405
EX 410 GOSUB 900:REM DRAW IT
JT 412 WRONG=0
MO 413 REM WAIT FOR KEYPRESS
AE 415 ITIM=MAXTIM
NM 420 ITIM=ITIM-1:FOR D=1 TO DEL:NEXT D
CW 422 IF ITIM<1 THEN 440
ZA 425 ? "↖";ITIM,"NOTE? ":GOSUB 1500
KV 430 IF PEEK(CH)=255 THEN 420
TN 435 IF PEEK(CH)=KCODE(N) THEN 460
ZY 437 REM WRONG - BUZZ
MA 439 WRONG=WRONG+1
EI 440 SOUND 0,85,12,8:POKE CH,255
WS 445 FOR D=1 TO DEL:NEXT D:SOUND 0,0,0,
   0
AE 446 IF WRONG>2 THEN ITIM=0
JL 447 IF ITIM<1 THEN 465
NT 450 GOTO 420
PX 459 REM RIGHT - PLAY THE NOTE
XF 460 SOUND 0,INOTE(N),10,8
XX 461 NN=INOTE(N):IF NN=0 THEN NN=254
XS 462 SOUND 0,NN,10,8
SJ 464 REM RIGHT OR TIMEOUT -- SHOW IT
UR 465 ? "↖";ITIM,"NOTE IS ";CNOTE$(N,N)
ZZ 470 FOR D=1 TO DEL*4:NEXT D:POKE CH,25
   5
VZ 475 GOSUB 800:SCORE=SCORE+ITIM
```

```
CD 480 NEXT ROUND
IP 489 REM WRAP-UP
KZ 490 SOUND 0,0,0,0:GRAPHICS 0
FT 491 SCORE=INT(SCORE/NRNDS)
CH 492 ? :? :? :? :? "            SCORE = ";
   SCORE:? :? :? :REM 9 SPACES
EV 493 IF SCORE>OLDSCOR AND OLDSCOR>=0 TH
   EN ? "        THAT'S BETTER!"
PC 494 IF SCORE<OLDSCOR AND OLDSCOR>=0 TH
   EN ? "  YOU'RE NOT CONCENTRATING."
HX 495 ? :? :? :? :? :? "  To play again,
    enter  Y   RETURN ":OLDSCOR=SCORE
GP 496 INPUT RNG$:IF RNG$="Y" THEN 250
KG 497 ? "K":? :? :? :? :? :? "  Next sto
   p:  The Lincoln Center!":? :? :? :?
PM 499 END
ID 500 REM ROTATE COLORS ON TITLE SCREEN
YM 505 TEMP=PEEK(711)
QE 510 FOR COLREG=2 TO 0 STEP -1:POKE COL
   REG+709,PEEK(COLREG+708):NEXT COLREG
NA 515 POKE 708,TEMP
ZF 520 RETURN
DL 700 REM DRAW LINE
OI 720 PLOT X-2,Y:DRAWTO X+6,Y
AW 799 RETURN
QR 800 REM UNDRAW NOTE
ZH 820 COLOR 0:REM BACKGROUND
OO 830 PLOT X,Y-2
XW 840 DRAWTO X+4,Y-2:DRAWTO X+5,Y-1
UR 845 DRAWTO X+5,Y+1:DRAWTO X+4,Y+2
EH 850 DRAWTO X,Y+2:DRAWTO X-1,Y+1:DRAWTO
   X-1,Y-1:DRAWTO X,Y-2
ZO 855 IF N<>1 AND N<>13 THEN COLOR 1
HZ 860 IF N<>2*INT(N/2) THEN GOSUB 700
AX 899 RETURN
LT 900 REM DRAW NOTE
NB 910 X=40+INT(RND(0)*80):Y=3*N+1
YG 920 COLOR 2
QR 930 PLOT X,Y-2
XX 940 DRAWTO X+4,Y-2:DRAWTO X+5,Y-1
US 945 DRAWTO X+5,Y+1:DRAWTO X+4,Y+2
EI 950 DRAWTO X,Y+2:DRAWTO X-1,Y+1:DRAWTO
    X-1,Y-1:DRAWTO X,Y-2
YQ 955 COLOR 1
BX 960 IF N=1 OR N=13 THEN GOSUB 700
AY 999 RETURN
YY 1000 DATA 35,40,45,47,53,60,64,72,81,9
   1,96,108,121,128,144,162,182,193,217,2
   43,0,0,0
CY 1010 DATA A,G,F,E,D,C,B,A,G,F,E,D,C,B,
   A,G,F,E,D,C,B,A,G
YR 1020 DATA 63,61,56,42,58,18,21,63,61,5
   6,42,58,18,21,63,61,56,42,58,18,21,63,
   61
IW 1050 DATA 20,40,20,4,26,7,26,13
WC 1051 DATA 20,16,14,19,8,22,8,28
EC 1052 DATA 14,32,20,34,26,32,30,28
YF 1053 DATA 26,24,20,22,17,24
OE 1060 DATA 10,51,10,53,8,53,8,50
TD 1061 DATA 12,48,17,46,22,48,26,52
PU 1062 DATA 26,56,24,60,22,62,17,64
PW 1063 DATA 15,65,12,66,8,67
CI 1200 REM INPUT ERROR TRAPS
EG 1265 ? " Please enter a number. ":GOTO
   260
MZ 1280 ? " Please enter a single letter.
    ":GOTO 270
QE 1500 DSBL=PEEK(16)-128:IF DSBL<0 THEN
   RETURN
GC 1510 POKE 16,DSBL:POKE 53774,DSBL:RETU
   RN
```

less memory, more speed!

# REM REMOVER

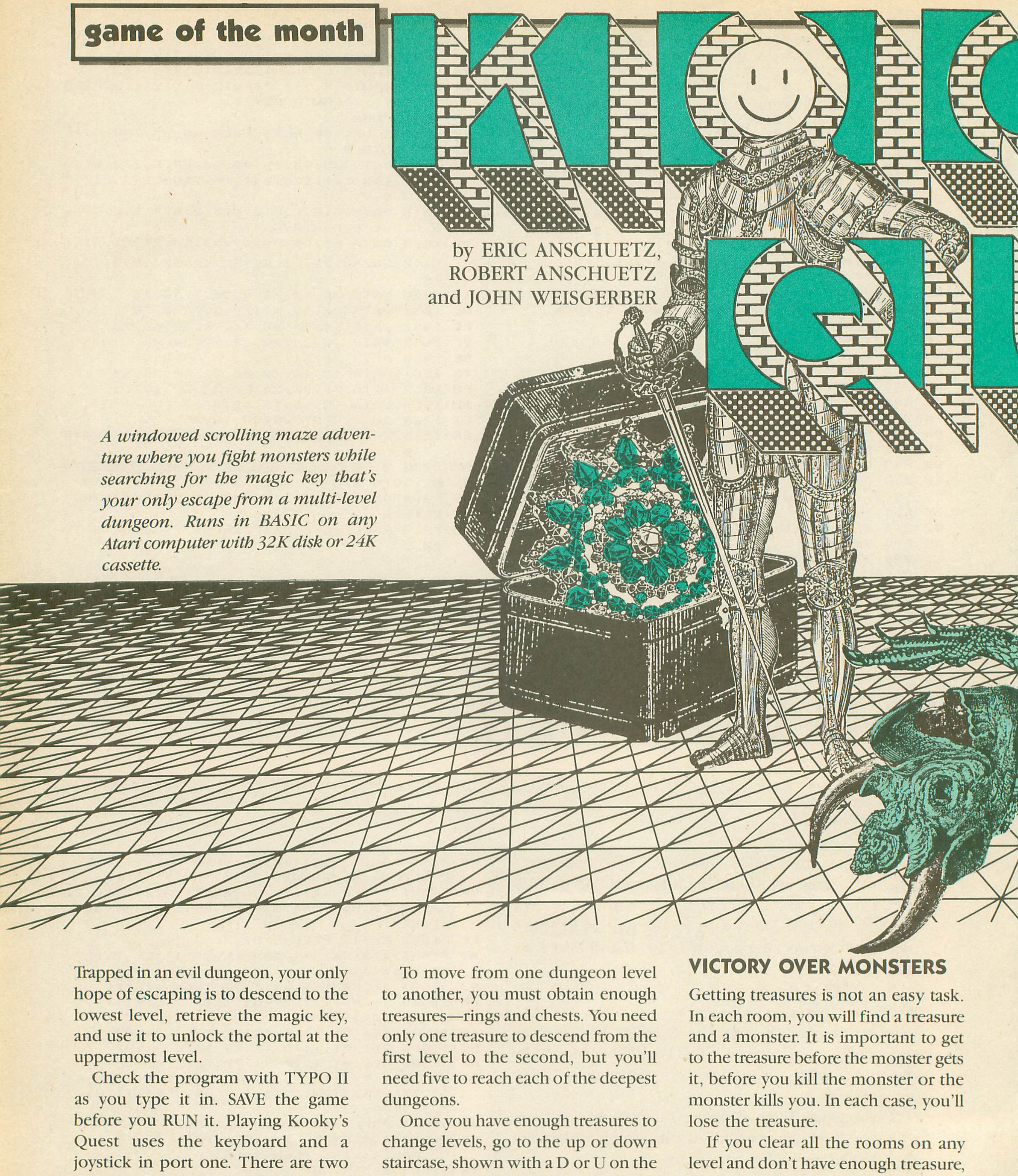
by F. NEIL SIMMS

REM Remover will delete all REMark statements from any BASIC program. Although programs without REMs are harder to modify, they run faster and take up less memory than programs with REMs. Type in REM Remover while checking it with TYPO II and LIST it to disk or cassette.

To use REM Remover, first ENTER or LOAD any BASIC program into memory. Next, ENTER the REM Remover program and type GOTO 31500. NOTE: Make sure your program doesn't GOTO or GOSUB any REM statements. Such programs will not run when its REMs are removed.

When all the REMs have been removed from your program, REM Remove will erase itself, leaving behind your "REM-less" BASIC program.

```
RN 31500 TRAP 31514:CLR :OPEN #1,12,0,"S:
   ":REM ** REMREMOVE ** F. Neil Simms
VP 31501 S=PEEK(136)+256*PEEK(137):POKE 7
   52,1:DIM B$(129):B$=" ":B$(129)=B$:B$(
   2)=B$
FF 31502 K=3:L=PEEK(S+2)
NY 31503 T=PEEK(S)+256*PEEK(S+1):IF T>327
   49 THEN 31515
NJ 31504 IF PEEK(S+K+1)<>0 THEN 31512
FH 31505 ? CHR$(125):POSITION 2,4:LIST T
OK 31506 POSITION 2,4
ID 31507 GET #1,T:IF T<>82 THEN 31507
MV 31508 GET #1,T:IF T<>69 THEN 31507
MC 31509 GET #1,T:IF T<>77 THEN 31507
JA 31510 ? "◀◀◀◀";B$;:POSITION 0,0:POKE 8
   42,13:POSITION 2,10:? "CONT":POSITION
   2,2:STOP
XU 31511 POKE 842,12:GOTO 31502
LH 31512 K=PEEK(K+S):T=PEEK(K+S-1):IF T<>
   22 AND T<>155 THEN 31503
YX 31513 S=S+L:GOTO 31502
QX 31514 ? "ERROR #";PEEK(195)
HW 31515 CLOSE #1:POKE 752,0:? "K":POSITI
   ON 2,4:FOR X=31500 TO 31516:? X:NEXT X
LY 31516 POSITION 2,21:? "POKE 842,12":PO
   SITION 2,0:POKE 842,13
```



by ERIC ANSCHUETZ,
ROBERT ANSCHUETZ
and JOHN WEISGERBER

*A windowed scrolling maze adventure where you fight monsters while searching for the magic key that's your only escape from a multi-level dungeon. Runs in BASIC on any Atari computer with 32K disk or 24K cassette.*

Trapped in an evil dungeon, your only hope of escaping is to descend to the lowest level, retrieve the magic key, and use it to unlock the portal at the uppermost level.

Check the program with TYPO II as you type it in. SAVE the game before you RUN it. Playing Kooky's Quest uses the keyboard and a joystick in port one. There are two skill levels. In the beginner game, you're aided by a displayed map of the dungeon, which is erased for the expert game.

To move from one dungeon level to another, you must obtain enough treasures—rings and chests. You need only one treasure to descend from the first level to the second, but you'll need five to reach each of the deepest dungeons.

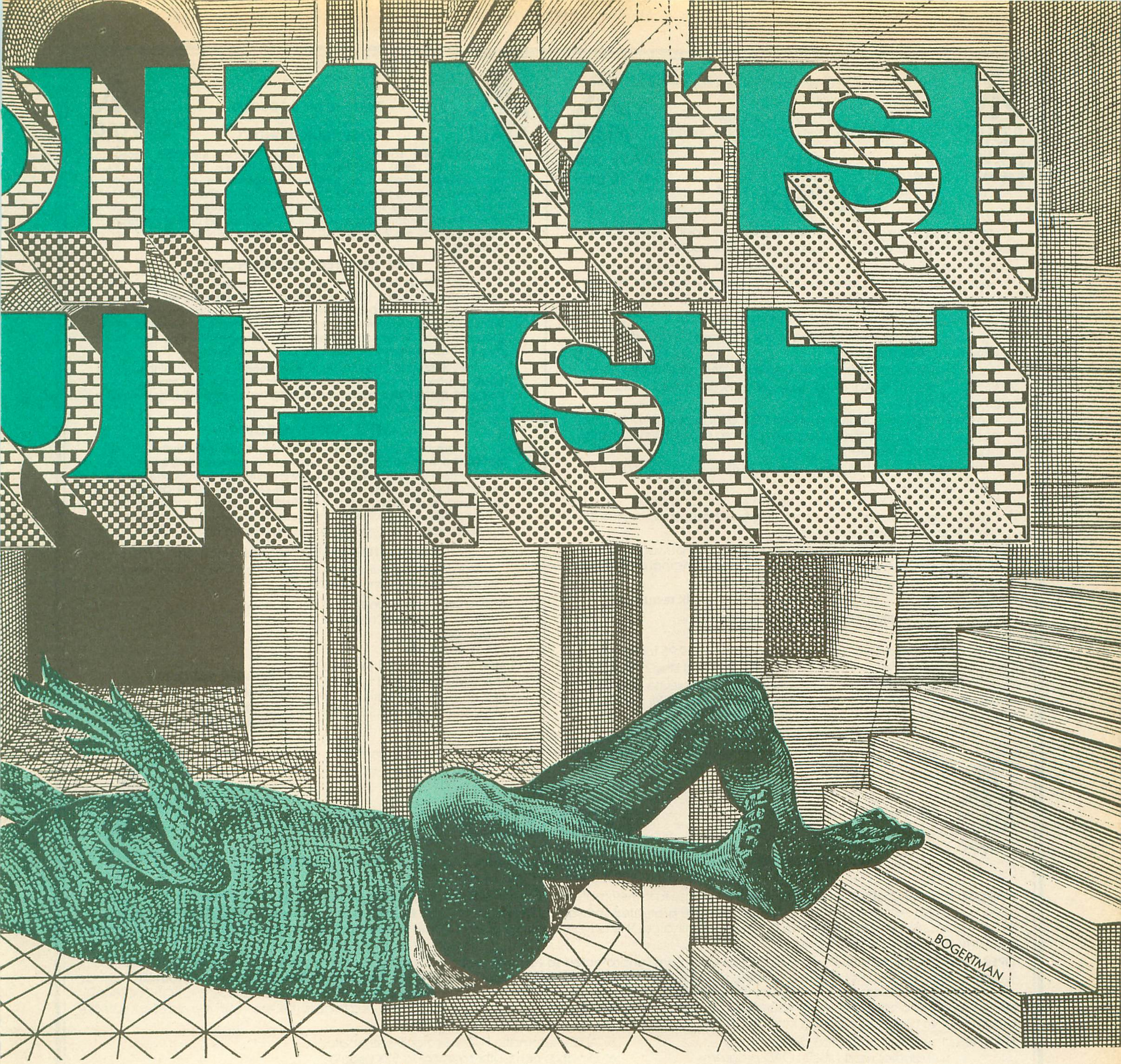
Once you have enough treasures to change levels, go to the up or down staircase, shown with a D or U on the map. If you are playing without the map, you can identify a staircase by sound effects, because the stairs aren't in your view.

## VICTORY OVER MONSTERS

Getting treasures is not an easy task. In each room, you will find a treasure and a monster. It is important to get to the treasure before the monster gets it, before you kill the monster or the monster kills you. In each case, you'll lose the treasure.

If you clear all the rooms on any level and don't have enough treasure, you'll be forced to wander that level forever—or until you stop the game.

You have ten lives for the entire game. If you'd like more, rejuvenate




yourself at line 610.

You'll be asked to choose a weapon as you enter a room. Available weapons are listed at the bottom of the screen and can be selected with numbers. The axe, mace and sword are swinging weapons—press the fire button and move the joystick from left or right.

The knife, lightning bolt and fireball are throwing weapons. They are used in the same way as swinging weapons—except they continue moving in a straight line until they hit something.

Choose your weapons with care. Each has different properties. You'll find that some require six hits to kill, others only one hit.

Note that while fighting, you can only attack to the left or right, and can't protect yourself from above or below.

You can encounter six types of monsters—vampire bats, giant hobgoblins, wicked skeletons, venomous serpents, decaying mummies and malevolent spiders that inhabit only the lowest level. Your adventurer, Kooky is shown as a happy face symbol.

Instead of escaping the dungeon, you may choose to accumulate points. Treasures are worth five points, defeated monsters ten.

*All three authors are 19-year-old computer science majors at Eastern Michigan University.*

Listing on page 51.

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As a special service, **Antic** is printing what we believe to be the biggest and most accurate list of Atari bulletin boards in North America.

This list comes to us from Idaho, where it is kept up by the Boise Users Group (BUG). It contains well over 200 BBS numbers. These numbers are checked every two weeks by a BUG BBS assistant sysop.

The list codes show hours of operation, baud rate and password requirements. **Antic** downloaded the list by phone and printed it immediately. So please note that these phone numbers are exactly what was sent out by BUG and cannot be guaranteed by this magazine to be entirely free of mistakes.

If *you* know about a BBS that is not on the list, please leave the number on the BUG bulletin board at (208)383-9547.

CODES:

L=LIMITED EVENINGS & WEEKENDS
*=24 HOUR OPERATION
@=300/1200 BAUD OPERATION
R=RINGBACK SYSTEM
P=FREE PASSWORD FOR FULL ACCESS
?=NO ANSWER AT THIS TIME

| ST | NUMBER | TYPE | NAME | CODE |
|---|---|---|---|---|
| AK | 907-338-1462 | FREM | FROST BYTE | P* |
| AL | 205-288-1100 | TBBS | JOE'S | @P* |
| AL | 205-928-2515 | FREM | PURPLE 12 | P* |
| AL | 205-979-8093 | AMIS | B.A.C.E. | * |
| AZ | 602-326-1186 | AMIS | ZANDOR | PL |
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| AZ | 602-790-8805 | FREM | TWILIGHT ZN | P* |
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| AZ | 602-840-9109 | AMIS | COMPUWIZARD | ?P* |
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| CA | 213-212-6414 | FREM | MADONA MARSH | P* |
| CA | 213-271-0224 | AMIS | TIME ZONE | |
| CA | 213-316-3929 | FREM | ATARI HEAVEN | PL |
| CA | 213-324-0218 | AMIS | S.W.A.M.P.S | * |
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| CA | 408-298-6930 | FREM | IBBS | P* |
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| FL | 305-475-9062 | AMIS | ORICAL | * |
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| HI | 808-833-2616 | RBBS | HAWAII DATA | * |
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| IL | 312-759-6297 | CARN | SATELITE | ?* |
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| IL | 312-789-0499 | RBBS | CHICAGO | @* |
| IL | 312-892-0417 | AMIS | LOCHLEVEN | L |
| IL | 312-889-1240 | AMIS | C.L.A.U.G. | * |
| IL | 312-925-2929 | AMIS | WIZ BANG | ?P* |
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| IN | 219-277-5565 | MULT | M.O.M.S. | L |
| IN | 219-980-3285 | AMIS | GAS STATION | L |
| IN | 812-273-5443 | FREM | COUNTRY CORN | L |
| IN | 812-379-1162 | AMIS | P.A.C.E. | @P* |
| KS | 816-363-1663 | AMIS | SAM'S | ?P* |
| KS | 816-796-9622 | AMIS | STAR BASE 3 | P* |
| KS | 913-262-0058 | FREM | MISSION | @P* |
| KS | 913-642-1743 | FREM | EXPRESSWAY | ?P* |
| KY | 502-247-3286 | | EARTH COM | L |
| LA | 504-273-3116 | RBBS | BATON ROUGE | * |
| MA | 617-259-0181 | TBBS | OUTPOST | @* |
| MA | 617-266-7789 | BULT | BOSTON BULLET | * |
| MA | 617-325-9147 | AMIS | R.A.M. | P* |
| MA | 617-332-5896 | AMIS | CASINO | * |
| MA | 617-371-1855 | AMIS | RAM COMP CTR | * |
| MA | 617-444-5401 | AMIS | KINGS CASTLE | * |
| MA | 617-595-0211 | AMIS | NORTH SHORE | @P* |
| MA | 617-663-4221 | | NITELITE 7PM-7AM | @L |
| MA | 617-667-7388 | AMIS | MACRO EXCH | @* |
| MD | 301-465-3176 | AMIS | | L |
| MD | 301-474-7591 | FREM | RECORD LABLE | @P* |
| MD | 301-587-2132 | ARMU | COMPUTER AGE | L |
| MD | 301-871-1094 | FREM | BBSOOSE | ?@* |
| MD | 301-972-4444 | FREM | WAR LORDS | ?P |
| MD | 301-974-4987 | CARN | SEVERNA PRK | * |
| ME | 207-774-5570 | AMIS | MAGIC CRYSTAL | * |
| ME | 207-839-2337 | AMIS | ATARI ELETE | @P* |
| MI | 313-352-8271 | | SY-DRAFT | * |
| MI | 313-368-4828 | AMIS | PLAY GROUND | ?L |
| MI | 313-427-1402 | AMIS | CAPT. KIRK | * |
| MI | 313-531-1701 | AMIS | ETHERNET | @* |
| MI | 313-538-0197 | AMIS | DARTBOARD | L |
| MI | 313-544-0885 | AMIS | M.A.C.E. | ?* |
| MI | 313-559-1676 | FREM | TRADING PLACE | * |
| MI | 313-662-8303 | RCPM | BARTON DATA | @P* |
| MI | 313-771-4126 | AMIS | FREEDOM BD | L |
| MI | 313-776-9792 | AMIS | SOFTWRE HAUS | |
| MI | 313-794-4603 | AMIS | COMET | * |
| MI | 313-882-5909 | CARN | TRADING POST | * |
| MI | 313-978-8087 | AMIS | A.R.C.A.D.E. | * |
| MI | 517-371-4234 | AMIS | C.H.A.O.S. | ?L |
| MI | 616-791-2109 | AMIS | G.R.A.S.S. | * |
| MO | 314-355-3403 | AMIS | M.I.C.E. | * |
| MO | 314-391-8451 | AMIS | MANCHESTER | * |
| MO | 314-647-3290 | AMIS | GATEWAY | @P* |
| MO | 314-928-0598 | AMIS | A.U.R.A. | @P* |
| MO | 816-796-9622 | AMIS | STAR BASE | L |
| MS | 601-388-3940 | FREM | COASTAL | L |

continued on next page

| | | | | |
|---|---|---|---|---|
| NC | 704-252-2145 | FREM | DARK SKULL | ?P* |
| NC | 704-541-3306 | AMIS | S.A.O.C.N.C. | * |
| NC | 919-323-3934 | AMIS | SOLDIER | * |
| NC | 919-867-0644 | AMIS | INMOVATIVE | ?L |
| NH | 603-749-6968 | AMIS | S.P.A.C.E. | P@* |
| NJ | 201-254-6449 | FREM | E.B.B.B.S | P* |
| NJ | 201-536-6585 | AMIS | DOJO | * |
| NJ | 201-566-8754 | AMIS | GHOSTBUSTER | ?* |
| NJ | 201-595-9107 | | NORAD | PL |
| NJ | 201-689-0492 | FREM | ENTERPRISE | P* |
| NJ | 201-962-6602 | AMIS | MID NIGHT EX | PL |
| NJ | 609-423-4865 | FREM | SWASHBUCKLER | P* |
| NJ | 609-451-7475 | FREM | C.C.B.B.S | P* |
| NJ | 609-652-2654 | | S.O.B.B.B.S. | |
| NJ | 609-751-0387 | FREM | TEMPLE DOOM | P* |
| NJ | 609-751-0569 | FREM | OUR GANG | P* |
| NV | 702-733-9488 | AMIS | S.A.N.C.C. | * |
| NY | 212-241-8965 | AMIS | SPIDER WEB | * |
| NY | 212-357-4112 | AMIS | AT.INN 11P-7P | L |
| NY | 212-366-9720 | FREM | MASTERS CSTL | @* |
| NY | 212-457-3304 | FREM | GREYHAWK'S | P* |
| NY | 212-464-3434 | AMIS | CRYPT | * |
| NY | 212-727-1380 | CARN | STAR TREK | L |
| NY | 212-746-3778 | AMIS | TITAN'S TOWR | PL |
| NY | 212-803-1363 | AMIS | ASGARD | L |
| NY | 212-927-6919 | AMIS | DANTE'S INFNO | ?* |
| NY | 212-951-8373 | | ATARI LIBRARY | L |
| NY | 315-451-7747 | AMIS | ACE BASE | * |
| NY | 516-328-1052 | FREM | HALL O JSTIC | PL |
| NY | 516-351-1748 | AMIS | PLANET EROS | P* |
| NY | 516-378-6747 | AMIS | MAGIC BBS | * |
| NY | 516-432-9372 | AMIS | C.I.A. | PL |
| NY | 516-467-1387 | FREM | LAKE BBS | PL |
| NY | 516-496-2554 | CARN | UNITEDNATION | P* |
| NY | 516-536-2089 | | BREAKER BBS | * |
| NY | 516-569-0187 | AMIS | ADVENTURE GM | PL |
| NY | 516-586-9765 | AMIS | S.C.A.M.S. | * |
| NY | 516-626-6990 | FREM | STARSHIP AT | P@* |
| NY | 516-671-5763 | AMIS | DUNGEON | * |
| NY | 516-673-3141 | AMIS | COLLOSSAL CAV | * |
| NY | 516-742-5949 | FREM | MOUNTAIN | @* |
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| NY | 516-878-8466 | FREM | CAMELOT | P* |
| NY | 516-944-6594 | AMIS | GENERAL STORE | L |
| NY | 516-997-7002 | AMIS | CSTL REVELSTON | * |
| NY | 914-245-4034 | FREM | 11PM TO 7 AM | L |
| OH | 216-271-9273 | AMIS | C.A.C.E | L |
| OH | 216-428-5087 | AMIS | PEEK+POKE | P@* |
| OH | 419-423-0206 | AMIS | FLAGCITY | * |
| OK | 405-348-4811 | | ALCATRAZ | L |
| OK | 405-681-6929 | AMIS | TEBBTOWI | ?* |
| OK | 918-836-4742 | AMIS | SAT EVE ONLY | L |
| OR | 503-245-9405 | FREM | P.A.C.E. | P* |
| OR | 503-256-3083 | AMIS | ASASIX | P* |
| OR | 503-343-4352 | ARMU | A.C.E. | * |
| PA | 215-398-3937 | RBBS | ALLENTOWN | * |
| PA | 215-432-5686 | FREM | ACTION EAST | @P* |
| PA | 215-836-5116 | RBBS | CHELTENHAM | @* |
| PA | 412-258-8733 | AMIS | BOSS-XL(1030) | * |
| PA | 412-655-2652 | ARMU | PACE | ?* |
| PA | 717-876-4721 | HBBS | N.E.P.A.T.S. | * |
| RI | 401-521-4234 | AMIS | A.A.R.I. | L |
| SD | 605-624-9409 | AMIS | VULGAR UNICRN | @L |
| TN | 615-623-0706 | AMIS | ACE-BASE | L |
| TX | 214-595-5345 | TBBS | TBBS#2 | * |
| TX | 512-285-4054 | AMIS | HICK CITY | L |
| TX | 512-442-1022 | | CHANNEL 1 | P* |
| TX | 512-443-3470 | ACPM | UTILITY BBS | P* |
| TX | 512-835-9742 | | BLACK BOX | * |
| TX | 512-837-2003 | AMIS | ARMADILLO | * |
| TX | 817-532-2981 | FREM | CENTREX | * |
| TX | 817-589-2588 | AMIS | COMPUTALK I | * |
| TX | 817-595-3195 | AMIS | COMPUTALK II | * |
| UT | 801-261-1356 | AMIS | THE OTHER BBS | L |
| UT | 801-479-0777 | AMIS | I.M.A.C.E. | * |
| UT | 801-943-3831 | AMIS | SLC A.C.E. | * |
| VA | 703-620-5309 | FREM | RED CABOOSE | P |
| VA | 804-898-7493 | | PEN A.C.E. | * |
| WA | 206-574-5438 | AMIS | ACTION BBS | L |
| WA | 206-632-9473 | AMIS | M.B.B.S. | ?* |
| WA | 206-892-8969 | AMIS | ACTION ANNX | * |
| WA | 509-456-8382 | FREM | FARSIDE | P* |
| WI | 414-259-9475 | | BIG TOP | ?* |
| WI | 414-355-6031 | AMIS | MIL-ATARI | ?* |

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| AL | 403-481-6569 | AMIS | 5TH D | L |
| AL | 403-487-0154 | AMIS | ELECTRO T'S | L |
| AL | 403-743-4206 | AMIS | ATARI FOREVER | L |
| AL | 403-791-0457 | AMIS | NORTH LIGHTS | L |
| ON | 416-731-4797 | | THE JAIL | * |
| ON | 519-252-0415 | AMIS | WINDSOR | ? |
| ON | 519-853-1063 | AMIS | PIT STOP | |
| QE | 514-366-0795 | FREM | TASK FORCE | P* |
| QE | 514-457-5582 | FLCT | ATARI CONNCT | P* |
| QE | 514-684-5464 | AMIS | CACHE | * |
| QE | 514-697-1279 | TACC | KURTZS CMPND | P* |
| QE | 514-697-9947 | AMIS | T.O.O.T.#1 | P* |
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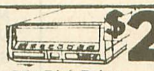
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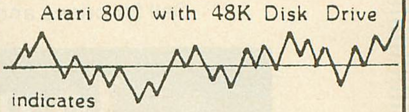
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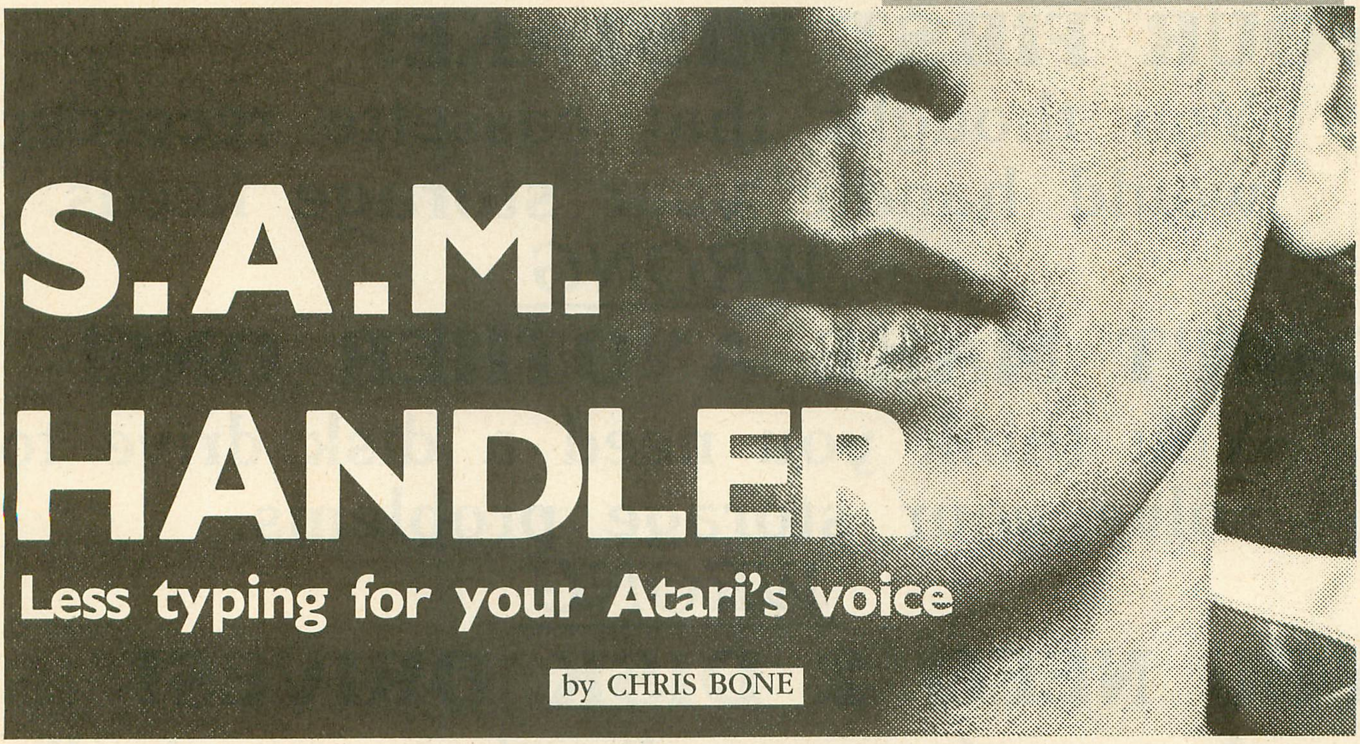
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# S.A.M. HANDLER

## Less typing for your Atari's voice

by CHRIS BONE

S.A.M. (Tronix, $59.95) is the sole software-only voice synthesizer for Atari computers. It costs considerably less than "black box" synthesizer hardware and sounds just about as good. With a little experience, you can understand just about everything S.A.M. says.

It's somewhat cumbersome to use, though—you must enter speech into a string, then execute a USR call.

This program makes using S.A.M. a good deal easier, and even adds a few extra capabilities. Type in Listing 1, check it with TYPO, and SAVE a copy. You don't need to type Listing 2 (SAMHANDL.ASM on the **Antic** disk) in order to use the program. Listing 2 shows the source code for the machine language portion of the BASIC program.

First load S.A.M. and RECITER according to the S.A.M. documentation. Then load the S.A.M. Handler and RUN it.

The program sets up a handler to allow the Operating System to treat S.A.M. as any other Input/Output device. To "speak," all you need to do is OPEN a channel for output to device V: (voice) (e.g. OPEN #1,8,0,"V:") and anything printed to that channel (such as: PRINT #1,"HELLO") is spoken by S.A.M.!

*Owners of S.A.M. (Software Automatic Mouth) can use this program to define the voice synthesizer as an I/O device—much like a printer. This allows you to program S.A.M. commands with less typing. This BASIC program will run on all Atari computers of any memory configuration —but you need S.A.M. software and a disk drive. Antic Disk subscribers, load S.A.M. and RECITER, then RUN "D:SAMHANDL.BAS".*

Now you can also have S.A.M. read out a program listing by LOADing the program, then executing LIST "V:". I use this to have S.A.M. read long DATA statements that I've typed in from published listings, while I check the statements on the printed page. This saves much of the time and frustration that's usually involved in checking a program.

The S.A.M. Handler remains active as long as you don't turn off the computer or press [RESET]. If the latter occurs, reinitialize the handler by executing A=USR(1536).

### PROGRAM TAKE-APART

This take-apart refers to the assembly language portion of the S.A.M. handler, Listing 2.

| | |
|---|---|
| 150– 410 | Initialize the handler. |
| 430–1020 | The handler itself. Lines 620–690 check for an end-of-line character, and if found, place a period at the end of the text to allow S.A.M.'s voice to drop in inflection and to speak the contents of the buffer. |
| 710– 750 | Check for comma and, if found, send a space after the comma. This is necessary for DATA lines, because if there are numbers on both sides of a comma, S.A.M. normally doesn't recognize it. |

*Chris Bone is one of **Antic**'s readers from England, from Watford, Herts., to be exact.*

Listing on page 49.

# YOU HAVE ALREADY MADE YOUR FIRST MISTAKE!

You thought that cassette recorder would handle your storage needs.

*WRONG*

# DON'T MAKE ANOTHER ONE!

You think you need a disk drive to solve your storage problems.

*WRONG*

# YOU NEED 2 DISK DRIVES!

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So now it will cost twice as much, right?

*WRONG*

You need an Astra single or double density dual disk drive. Two drives in one

*A drill program that helps students learn the names of notes on the musical staff. The BASIC listing runs on all Atari computers of any memory configuration. Antic Disk subscribers RUN "D:MUSFLASH.BAS".*

# Music Flash Cards

by JAMES BROWN

Here is a fairly simple program I developed when my daughter started taking piano lessons. When learning a new subject, some drill and practice is often necessary to sharpen skills. This is just the thing for a computer, which can present the material in a more interesting way than most human "drill instructors", and which never gets bored or impatient.

The purpose of Music Flashcards is to teach the positions of notes on the musical staff. The program reinforces each correct answer by sounding the corresponding note. It uses the regular low resolution Atari sound voices, however, so the pitch is not very precise. This deficiency can easily be overcome by using the technique of coupling two sound generators to produce high-precision tones. Such a change is recommended if you want to teach pitch recognition at the same time.

The program is very simple to use for any child who has enough experience with the computer to know that it is usually a good idea to press [RETURN] to complete an input. This is necessary only in the initial "set up" sequence. During the timed response segment, only a single keypress, representing the note shown, is needed. So, after entering the program, correcting it with TYPO and saving a backup copy, all you need do is type RUN and answer the prompts. The program keeps your score, which ranges from the high 90's if you really know your notes and have fast typing reflexes, down to zero if you aren't paying any attention at all.

You can limit the drill to either the treble (G) clef, or the bass (F) clef, or include both. This way the student can concentrate on whichever area is currently being studied in regular music lessons.

*James W. Brown is supervisor of the Database System Engineering Group at the Caltech Jet Propulsion Laboratory (JPL) in Pasadena, California, and is librarian of the JPL Atari Computer Enthusiasts user group.*

**PROGRAM TAKE-APART**

| | |
|---|---|
| 100– | Three arrays hold the note values for the SOUND command, the character name of the note, and the corresponding keycode. |
| 115– 238 | Set up the title screen, read note values into arrays, and play a sequence of notes while rotating the colors on the marquee. |
| 240– 245 | Address pointers, and initialize previous score. |
| 250– | DEL is the value used for delay loops. It can be adjusted to slow down or speed up the drill. MAXTIM counts down to zero while waiting for a response. |
| 255– 267 | Prompt for and accept the number of notes for this drill sequence. Note error trapping. |
| 269– 285 | Prompt for and accept the choice of staff — bass, treble, or both. |
| 299– 327 | Draw lines of staff. |
| 330– 380 | Draw clef symbols. |
| 400– 480 | Loop for drilling notes. |
| 405– 407 | Randomly pick a note from the selected range. |
| 410– | Draw the note. |
| 420– 430 | Timing loop — wait for keypress. |
| 435– | Check for correct answer. |
| 437– 445 | Sound buzzer if wrong answer. |
| 446– | Allow up to two wrong answers. If three, assume student is guessing or playing around. |
| 447– | If time runs out, show the right answer and continue. |
| 450– | If time remaining, try again. |
| 459– 462 | Sound the note. |
| 464– 470 | Show the name of the note. |
| 475– | Erase the note and tally the score. |
| 490– 499 | Summarize results. Encourage improvement, but don't accept backsliding. |
| 500– 520 | Subroutine to rotate colors. |
| 700– 799 | Subroutine to draw a short line through a note (middle C or A above staff). |
| 800– 899 | Subroutine to erase a note. |
| 900– 999 | Subroutine to draw a note. |
| 1000– | Sound values for notes. |
| 1010– | Names of notes. |
| 1020– | Keycodes of notes. |
| 1050–1053 | G clef symbol. |
| 1060–1063 | F clef symbol. |
| 1200–1280 | Error trap handlers. |

Listing on page 54.

# PARALLEL

*For the first time, advanced users of the Atari 800XL and 600XL learn how it's possible to connect peripherals to the fast, powerful Parallel Bus Interface. Part 2 of a 4-part series.*

Last month we looked at the general operation of the Parallel Bus Interface (PBI) emphasizing software concepts. This month, we'll look at the hardware concepts involved in making an external device work via the parallel bus.

*Figure 1* shows the basic requirements for a simple serial I/O function such as an RS-232 board. The serial I/O device can be an integrated circuit that looks like a set of registers to the computer. The decode logic selects the device when the assigned PBI addresses are presented on the address bus.

Beyond that, the computer needs to be able to read and write data to the device and respond to its requests for service. That's what the Read/Write and Interrupt Request lines are for.

When the computer wants to talk to a parallel bus peripheral, it enables the decode logic with a signal called External Enable. The decode logic decides whether the address on the bus is for the device or for the 2K ROM.

If it's for the ROM, the decode logic returns a Math Pack Disable signal to the computer so that internal ROM won't contend with the 2K ROM for the data bus.

*Figure 2* shows the approximate timing of the External Enable (EXTENB) and Math Pack Disable (MPD) signals.

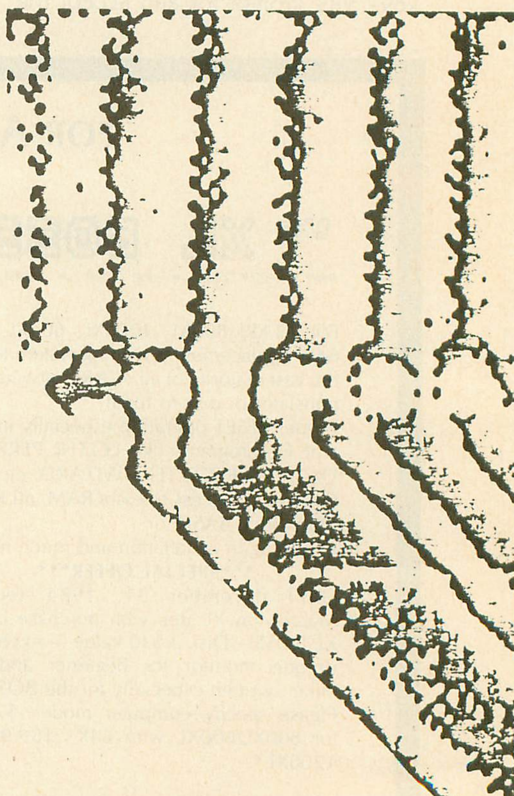
*Figure 3* is a more detailed schematic of the hardware example. This is still not the complete design, but it serves to illustrate the concepts some more.

The decode logic does several things:

- Decodes the $D8XX—$DFXX block to enable the 2K ROM.
- Decodes the D1XX block for device registers.
- Decodes the address $XXFF so the computer can select the Device Enable latch at $D1FF. This latch represents the select bit in the Device Select register (DEVSEL).

In *Figure 3*, the latch is tied to the data 0 line (for device 0). But it could be tied to another line to make the device respond to a different ID number—such as bit 3 for device 3. For simplicity, the latch is a write-only bit. When we expand to a full design, we'll see how to make a readable register. We would need to do that to make the peripheral available to an interrupt service routine.

The Device Enable latch must be set to allow the computer to address the 2K ROM or the device registers. Its output is also gated with the 2K ROM select line to send the MPD signal to the computer. The Device Enable latch is set by writing a 1 to $D1FF. It is reset by writing a 0 to $D1FF.



*Earl Rice was head of users group support at Atari before moving on to be project leader of the now-cancelled 1450XL computer.*

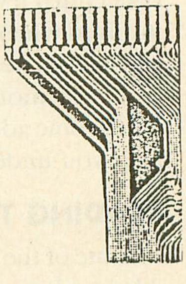
continued on page 70

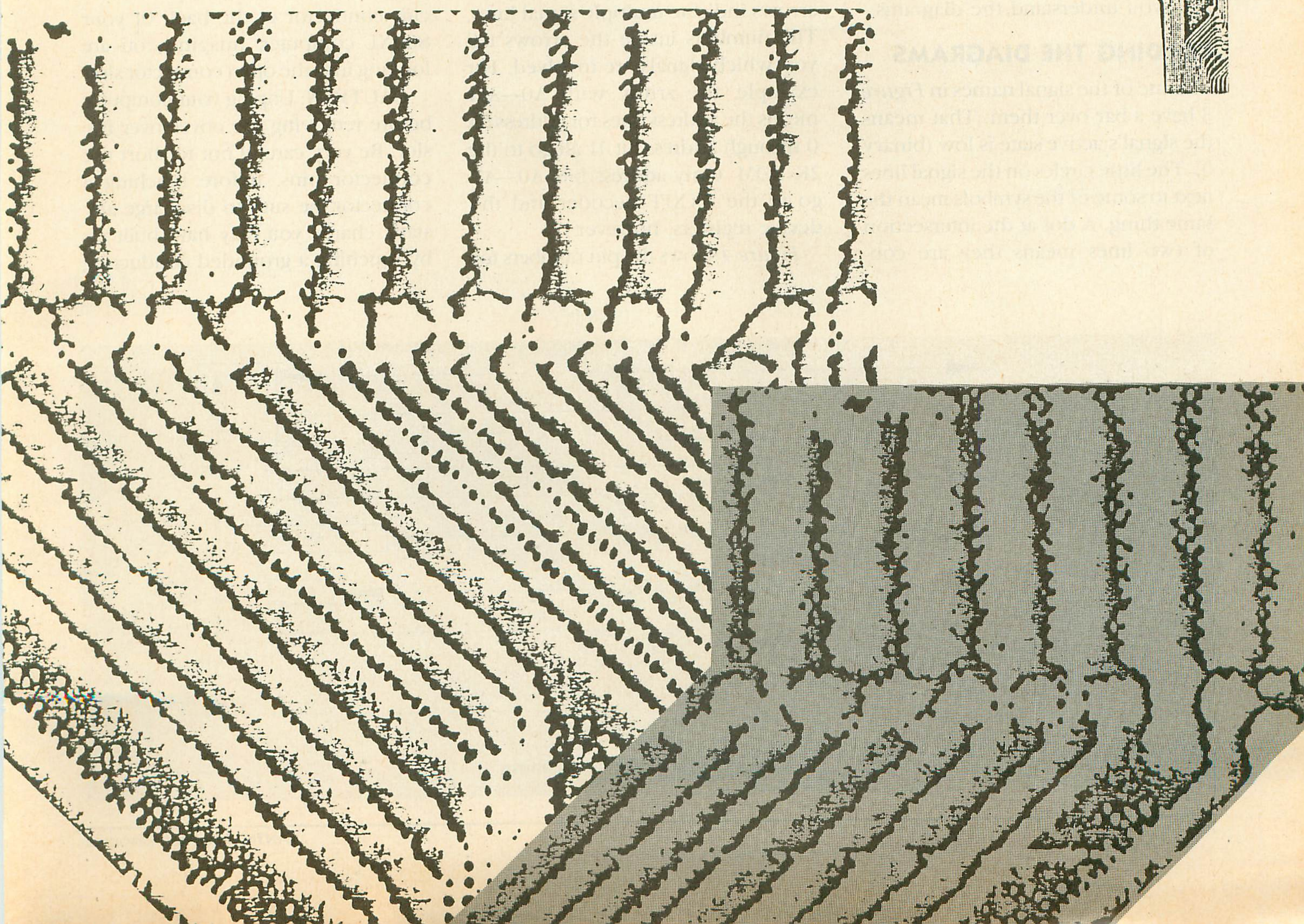
# BUS REVEALED

## 100,000 bytes per second

*Part II of a four part series*

by EARL RICE





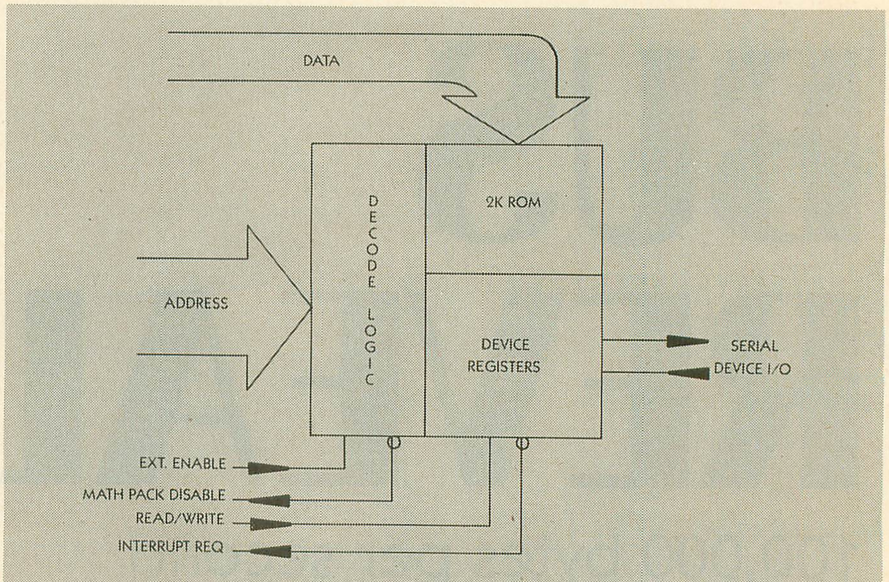


Figure 1.
**Serial Interface Block Diagram**

## SUMMARY

The basic concept isn't hard. The external hardware is enabled by EXTENB. It must decode the 2K ROM space, device registers, and Device Select register. When the 2K ROM is selected, it must return a Math Pack Disable signal to the computer. If the device is interrupt driven, it must supply an Interrupt Request(IRQ) to let the computer know it wants to be serviced. In that event it will also need to supply an IRQ ID number to the computer.

Simple? Sure is. . . At least at the conceptual level. It gets a little more involved when we design the decoder and have to deal with timing. We'll do that next month. In the meantime, here's some additional information to help you understand the diagrams:

## READING THE DIAGRAMS

Some of the signal names in *Figure 3* have a bar over them. That means the signal's active state is low (binary 0). The little circles on the signal lines next to some of the symbols mean the same thing. A dot at the intersection of two lines means they are connected. If they cross without a dot, they aren't connected. The wide arrows indicate multiple signal lines. The numbers inside the arrows tell you which signals are involved. For example, the arrow with A0—A11 means the address lines for address bit 0 through address bit 11 all go to the 2K ROM. Only address bits A0—A7 go to the $XXFF decoder and the device registers, however.

*Figure 4* shows the pin numbers for the PBI signals. It also shows how the pins are numbered on the printed circuit connector at the back of your 800XL computer. Imagine you are looking into the open connector slot.

**CAUTION**: Unplug your computer before removing the cover over the slot. Be very careful not to short the connector pins. Before touching a connector, be sure to discharge any static charge you may have built up by touching a grounded conducting

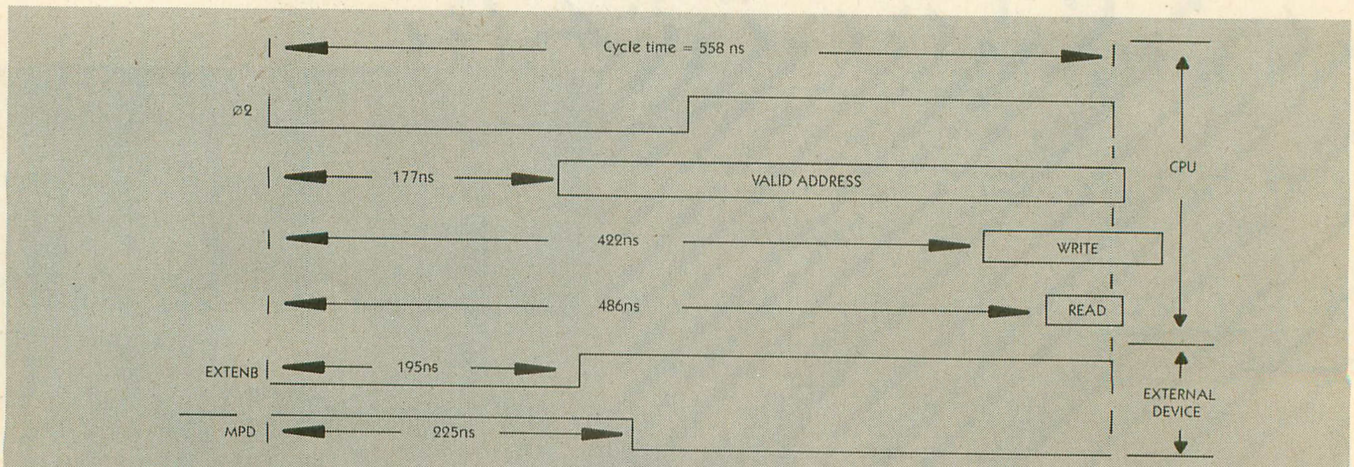


Figure 2.
**CPU—External Device Timing**

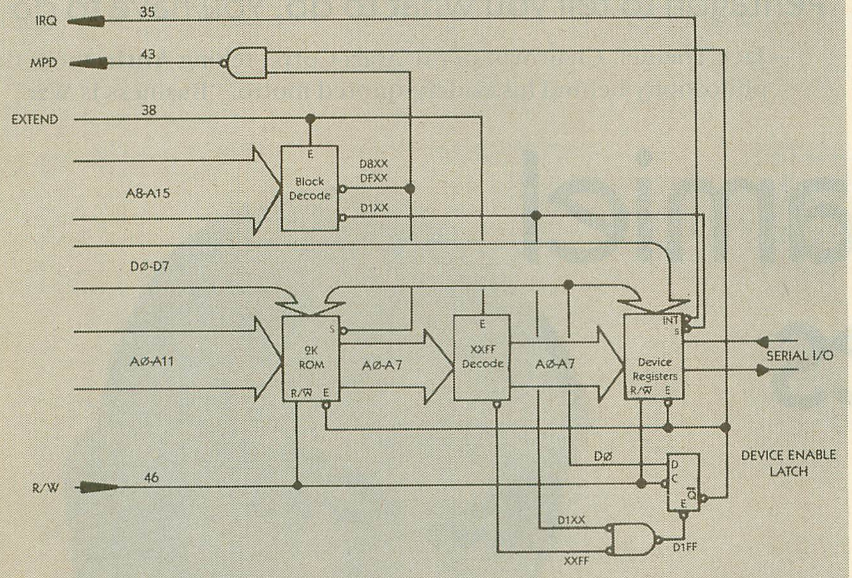
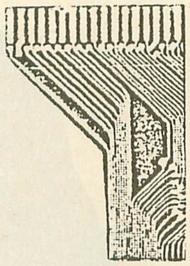



Figure 3.
**Simplified Serial Interface Schematic**

object (such as a cold water pipe). **STATIC CHARGES CAN DESTROY INTEGRATED CIRCUITS! BE CAREFUL!**

Next month, we'll look at a serious design for a sort of baby 850 Interface—a serial I/O device useable for driving modems and such.



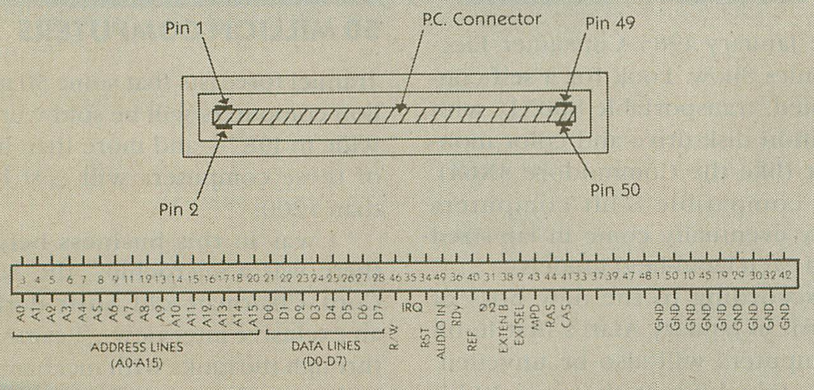



Figure 4.
**Parallel Bus Pinout**

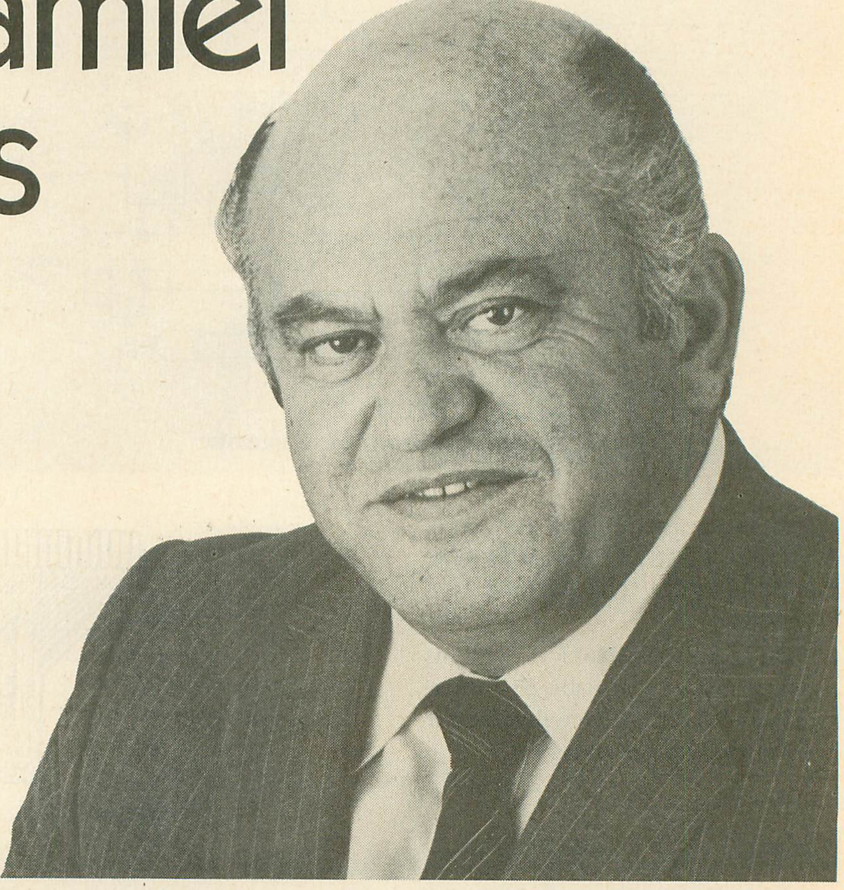
"When I get depressed, I watch the 'Patton' movie. I believe in that. I don't think you can sit on your butt. You have to know who your competitor is—who your enemy is. You have to have better tanks. You have to have better equipment to be able to win. And you can't just wait for the Pentagon to tell you what to do. You have to do it."

—Jack Tramiel, Chairman of the Atari Corp., telling **Antic** about the philosophy behind his widely-quoted motto, "Business Is War."

# Jack Tramiel Declares War!

## 3 enhanced 800XLs in '85?

by JAMES CAPPARELL, MIKE CIRAOLO, NAT FRIEDLAND and GARY YOST



Jack Tramiel expects to sell around 500,000 800XL's over the 1984 Christmas season. This would put Atari back in the black after an $875 million loss from the previous 18 months. Factories in Taiwan and Ireland are turning out 150,000 computers a month. A new factory is being started in Japan. The company projects $1 billion sales for 1985.

As many as three upgraded all-compatible 800XL's—some with 128K memory—are to be shown at the January 1985 Consumer Electronics Show. Look for a self-contained, transportable 800XL, with built-in disk drive and color monitor (like the Commodore SX64). XL-compatible 8-bit computers may eventually come in lap-sized and even hand-held models.

According to the new boss of Atari, in January Atari's first 16-bit computers will also be unveiled. The first look at the new 32-bit Atari computers is to come at the April electronics fair in Hanover, Germany.

**50 MILLION COMPUTERS**

Tramiel forecasts that some 50 million computers will be sold worldwide in 1987—and more than half of these computers will cost less than $200.

"I was in this business before there was a microchip," the Atari Corp. Chairman told **Antic** during an exclusive interview. "I came up through the ranks with mechanical adding machines, electronic calculators and then computers."

Tramiel started Commodore in 1955, brought out the second handheld calculator, and won the com-

pany the biggest share of home computer sales. In 1968—when calculators sold for $1,495—he predicted that the price would drop to $9.95 within 10 years. "If anything, I was too conservative then," he commented. "You get a good, basic calculator for even less than $9.95 and 70 million calculators were sold last year."

And how does Atari fit into the coming mass computer market? "My goal at Atari is to make the best computer at every meaningful price point between $100 and $1,000," the Atari Corp. Chairman told **Antic.**

"Any competitor is welcome to approach our market,'' said Tramiel. ''But they have to be willing to work as hard and as efficiently, to take as many risks, as we do."

## WHAT SELLS BEST

To Tramiel it's an undeniable fact that the best computer value will be the best seller. "End-users are intelligent. They know what they want and they know what it's worth,'' was a point he made several times during the interview.

"We sell products to individuals—personal computers," said Tramiel. "Our customers are from six to 26 years old. They know about computers and they don't need to be educated by the advertising, the way IBM users do."

In mid-November Tramiel and his top management team held their first press conference, at Atari headquarters in Sunnyvale, California—to announce the 800XL's new low $119.95 suggested list price.

Immediately following the feisty, free-swinging press conference, Tramiel went into private interviews with a few selected publications, including **Antic.**

This event ended four months of virtual silence since Tramiel took over Atari in July, 1984. With a dramatically lowered price and 150,000 800XL's being produced each month, Tramiel and his associates seemed almost fanatically determined to show that the pressing problems of the ownership change had been solved, and Atari was now reopening a flow of information.

During an informal lunch following the press conference, Atari Division Presidents and Vice Presidents (including two of Tramiel's three Atari-employed sons) circulated freely and answered just about any questions except the specific hardware details of the coming '85 Atari computers.

## ATARI GETS GEM

For example, Atari Corp. President Sam Tramiel confirmed that their new 16-bit and 32-bit computers will use the Macintosh-like icons of the GEM operating environment from Digital Research, developers of CP/M. The younger Tramiel said that GEM would be the user-friendly "front end" to a new Atari proprietary operating system for the advanced machines.

At one point during lunch, Sam Tramiel reached over and borrowed the napkin being used by Greg Pratt, president of Atari (U.S.) Corp. "We're all family here," said Sam, echoing his father's earlier press conference comment that the new Atari management was "like part of my family."

Pratt, a young CPA who was recently Director of Operations at Commodore, had a direct answer to our inquiry about why so many of Commodore's key managers had quit to resume working for their former boss. "Jack Tramiel is a benevolent dictator," he laughed. "But he's the brightest man I ever met."

Another young marketing manager who had stayed over from the previous Atari ownership said, "Jack is always helping you, teaching you. If you're on the wrong track, he'll ask you questions so you realize your mistake."

## TRAMIEL EXCLUSIVES

Upon meeting Jack Tramiel, it's hard to avoid thinking of "Little Caesar" and the other classic Edward G. Robinson movies. Tramiel —born in Poland in 1928 and a survivor of the Auschwitz concentration camp—is short, heavy, fast-moving, smokes big cigars, talks rapidly in a loud, booming voice, laughs heartily and often.

Some of the significant points he made during the **Antic** interview were:

- Atari is examining a cohesive new plan for national support of user groups.
- Advanced new modems are among the products being developed by Atari's Tokyo-based engineering group.
- Educational discount prices will be offered to schools from Atari by direct mail in 1985.
- Look for a full size color printer from Atari this year.
- New Atari software for the 800XL line won't cost more than $49.95.

We ended the **Antic** interview by asking Tramiel what's the biggest surprise we should expect from Atari before the end of the decade.

"Our expertise over the years is in converting the best proven technology to the lowest price," he said. "In the next three years we will again take a very sophisticated product like the DEC (Digital Equipment Corp.) VAX superminicomputer and use state-of-the-art semiconductor technology to bring it down to a few chips for the personal computer customer."

The phenomenal new 32-bit NS32032 microchip from National Semiconductor would in fact make this possible. But there was silence around the interview table for a moment before we asked, "Did we hear you right? Are you actually saying that within three years Atari is going to market a small, user-friendly computer with the power of a VAX?"

"Yes!" said Jack Tramiel very firmly.

# product reviews

## ARCHON II: ADEPT

Electronic Arts
2755 Campus Drive
San Mateo, CA 94403
(415) 571-7171
$40—48K disk

*Reviewed by Steve Panak*

It's dangerous to release a sequel to a legendary strategy game like **Archon**, but Electronic Arts made no mistake with **Archon II: Adept.**

The format of Archon II is similar to the original game. A rectangular playfield is surrounded by bands of air, water, earth and fire. Characters can be moved throughout one element, or may jump to adjacent bands.

You're limited only by your energy force, which is shown at the side of the screen. Using a spell consumes some of this energy, depending on the spell's strength. Conserving your energy is a major part of strategy, because most actions consume energy. You obtain more energy by occupying power points on the field.

Play starts with four Adepts on each side. Your Summon Spell populates the playfield with an army of creatures, each with different attributes.

When two opposing creatures attempt to occupy the same board position, only one may remain alive. The board is replaced by a full screen arena where an arcade-like battle is fought.

Victory is yours if you occupy all the power points, succeed with the winner-take-all Battle of the Apocalypse Spell, or use up all your opponent's icons or energy.

Electronic Arts has included a humorous, intelligently written manual to help you learn the game.

Sounds fairly simple, right? Archon II is simple in the same way chess is simple. The basics are easy to absorb, but the intricacies of strategy make this one of the potentially timeless computer games.

## BRIDGEPRO

Computer Management Corp.
2424 Exbourne Court
Walnut Creek, CA 94596
(415) 945-0321
$35, 32K—disk

*Reviewed by Harvey Bernstein*

**Bridgepro** is the first Atari program I've seen that provides a challenge for the average-to-excellent bridge player. You bid and play the South hand, while the computer becomes your North partner as well as the two opponents.

Help is offered to the novice during bidding. The program will provide a total point count if requested and can even suggest bids. You may not always agree with the suggestions, but for the most part they are within the standard bridge protocol.

During play, a Graphics 0 display lays out your hand, as well as the cards that have been played. One of the game's best features is Auto-Finish, which allows the computer to play out all four hands. The program plays a good, workman-like game, although it doesn't seem to have been programmed to finesse, and some of the leads are questionable at best.

> Documentation is excellent and allows a new bridge player to learn the basics.

Documentation is excellent and provides enough information to allow a new bridge player to learn the game's basics. All bids and cards played are entered via one or two key input and the speed is variable.

The only real shortcoming is the program's excessive use of the speaker, and it's balanced by other nice features such as the two-player mode. This allows two people to compete on separate rubbers, either with different deals or in a duplicate tournament. If you feel you blew a finesse or a bid, you can replay a hand.

## TINK'S ADVENTURE TUK GOES TO TOWN

Mindscape, Inc.
3444 Dundee Road
Northbrook, IL 60062
(312) 480-7667
$34.95 each, 48K-disk

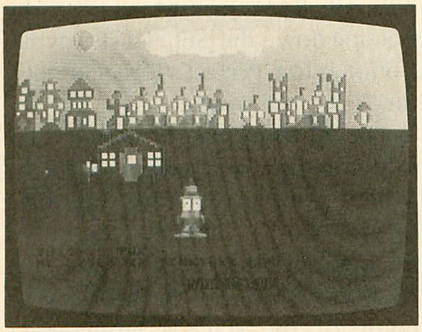
*Reviewed by Anita Malnig*

Children's book author/illustrator Mercer Mayer has created learning games for children aged 4-8 that are some of the most enjoyable and graphically inventive software around.

Especially delightful about **Tink's Adventure** and **Tuk Goes To Town** are the bright graphics in greens, oranges, blues and yellows; the finger-snapping music; the silly shapes of the robots and the cartoon-like way they scuttle around. Mayer knows how to create and develop characters, tell a story and draw funny pictures.

Tink, a brightly-colored robot, lives in TinkTonk Land with other robots named Tuk, Tonk and Tinka. (An accompanying book explains all this in grand style). Young players decide whether to play a game or go along on Tink's Adventure. If an adventure is chosen, lots more choices come up.

Tink can go by boat or helicopter. If helicopter is picked, players can 1. Fly Away, or 2. Play "Get Gas." In "Get



TUK GOES TO TOWN

Gas" the player must fill the tank by inserting the correct letter in a sequence, such as GHIJ__.

All the games in Tink's Adventure teach the alphabet and the computer keyboard. It will be important for the adult to explain the Atari keyboard since the program does not.

By the end of the adventure, Tink travels by land and sea, explores an island and meets a giant. Children must hit the right letter keys so apes won't drop coconuts on Tink's head, and steer Tink's helicopter through the clouds.

When Tuk Goes To Town, he can travel by eight different modes of transportation including car, bus, motorcycle, raft, etc. The format is the same as Tink's Adventure—play the game of your choice, or follow the story and play games in context.

"Farm Game" offers spelling practice and vocabulary building by first showing animals and their scrambled names, then scrambled farm words with no accompanying pictures. "Forest Game" tests memory by asking the player to remember where letters are hidden in order to make a word.

Other games call for unscrambling words, while in some you must identify shapes. Two games are just for fun. Choosing new suits for Tuk was the most entertaining for me—I got to give him round or square hats, polka-dot shirts and weird-shaped shoes. However, the target range, where players must match a shape to knock down a duck, will certainly appeal to many.

Tink and Tuk face adventure head on, scamper about the screen to some of the best computer music going, and offer younger children hours of fun—with some learning thrown in. **Tonk in the Land of BuddyBots** was Mercer Meyer's first charmer in this Mindscape "Sprout" series. Let's see more soon!

## STEALTH

Broderbund
17 Paul Drive
San Rafael, CA 94903
(415) 479–1170
$29.95—48K disk

*Reviewed by Jack Powell*

Skimming low over the ground. Avoiding the radar and coming upon the white bunkers unawares. Blast them! Destroy them before they destroy you. Then head on, low, kissing the ground, onward to destroy the dark tower looming on the horizon, thousands of meters high.

Hot news, gang! Broderbund has a new arcade game out. It's called **Stealth** and it looks like something plucked right out of the arcade palaces. Excellent graphics and the sound is better than usual for a Broderbund game. (Could it be this game was not originally designed for the squeaking Apple?)

Skimming over an alien landscape, your goal is to steer your fighter plane past various hostile obstacles and destroy the dark tower that grows on the horizon. This may seem like a pretty single-minded goal to base a modern arcade game on, but the graphics in this program create an excellent sense of place and dimension. The tower does seem miles off and, as it grows, you find yourself hypnotically involved in the effort to avoid the enemy and blow up the tower.

There are five levels to the game. Each is similar in appearance, but the color of the world changes and the number of enemies increases. Upon booting, you can go to any of the first three levels, but you must fight your way to the fourth and fifth. On the highest levels, volcanos appear and death is imminent.

Stealth is a welcome fix for the shoot-'em-down-in-flames arcade freaks who have been wondering where the next serious laser-zap would come from. Don't worry too much about strategy, just react and blast. There are, according to Broderbund, a variety of endings which load in randomly. I've seen just one and it was worth waiting for.

## CHANCELLOR OF THE EXCHEQUER

Mach-ina
161 Aragon Avenue, Suite 202
Coral Gables, FL 33134
(305) 445-0027
$29.95, 48K-disk

*Reviewed by Edward Bever*

While the railroads were fulfilling America's manifest destiny, Adam Smith's "invisible hand" was busy guiding the flow of resources and investments in Britain's Industrial Revolution.

Smith's role is yours as you play **Chancellor of the Exchequer**, an economic simulation concerned with raw material production, manufacturing, consumption, allocating resources, and transportation. Your goal is to draw together eight regions between the game's start in 1805 and its end in 1915.

Bold in concept and design, this game includes an extensive help program, an analysis program to provide feedback on your progress, and instructions written in a chatty English style that puts the computer in the

continued on next page

role of an indulgent underling.

Chancellor deals primarily with numbers, and is best used in lieu of drier textbooks or lectures. It works better as a learning tool than as a purely recreational game.

## SAMS ATARI PHOTOFACTS

Howard W. Sams, Inc.
4300 West 62nd Street
Indianapolis, IN 46268
(317) 298-5400
$17.50

*Reviewed by Scott Schrader*

Matching the pen scratches of schematic diagrams to actual circuit boards has always been a tricky business. A significant improvement in the way this information is presented is the **Computerfact** service manual series published by Howard Sams, which currently includes separate books covering the 400 and 800 computers, the 410 cassette recorder and the 850 interface.

A long-standing tradition in the repair industry, Sams Photofacts manuals feature labelled photographs showing the location of test points, complete parts listings, and plenty of test and service tips.

These Atari manuals offer almost as much to the home user as they do to the professional serviceman for whom they were designed. For example, the section on preliminary service checks gives a number of steps anybody can perform to catch minor problems without opening up the computer case.

Pin assignments for all connectors on the mother board and information on which solder point holds what signals are among the functions clearly labelled on the "CircuiTrace" photographs.

Unlike Atari's own hardware manual, Sams' photo schematics show the coils and capacitors used on the serial bus to prevent CB radio signals from being mistaken for disk drive input. Where possible, part numbers like Q101 are translated into standard replacement numbers which can be obtained anywhere.

Sams also gives logic probe readings and oscilloscope signals, which narrow down a malfunction to a specific bad transistor or chip.

Atari owners who do not have solid technical electronics skills should not consider taking tools to the inside of their computers. But still, the $17.50 for my Sams manual is insurance money well-spent. It might well enable me to provide the information that gets my modified machine repaired at a professional shop. And if you're somewhat hardware oriented, it can be interesting reading.

## XL BOSS

Allen Macroware
P.O. Box 2205
Redondo Beach, CA 90278
(213) 376-4105
$79.95, 600/800XL version
$89.95, 1200XL version

*Reviewed by Thomas Rainbow*

Ever wanted to replace the goofy Atari XL-model operating system that's incompatible with so much classic software? The **XL Boss** is a ROM chip that not only eliminates the need for a translator disk—it also gives you access to 4K RAM at location $C000 (49152) which Atari tucked away for future applications.

Installing the XL Boss chip requires opening up your Atari and replacing the El Stupido OS chip with this nice new one. The directions are quite explicit. My gifts do not include mechanical aptitude, yet I managed to complete the surgery in about a half hour.

The XL Boss made me feel like Superman suddenly regaining his stolen powers! Great Krypton, I have 32K of RAM instead of 28K by holding down the [SELECT] key while I boot Letter Perfect. That's enough for 700 extra words.

The XL Boss comes with a nifty monitor program called XLMON. With it, you can manipulate any byte in the Atari's memory map. For example, location FEC3 (65219) in the XL Boss OS controls the background color of the screen. From Letter Perfect, I hold down the [OPTION] and [SELECT] keys, then push [RESET] and whammo, I'm in XLMON. I display the contents of FEC3, replace it with a 0 to generate a black background, press [SELECT] [RESET] and there's black.

The XL Boss is a ROM chip that eliminates the need for a translator disk.

XLMON even has a feature to convert back and forth between decimal numbers and hexadecimal numbers. So when you're snooping in a program's innards, you have a built-in English-Babylonian dictionary.

A disadvantage of the Boss is that unlike the original XL OS, it doesn't support hardware applications via the parallel bus. This means if someone comes out with a memory extender similar to the ill-fated Atari expansion box, the Boss won't work. However, Allen Macroware claims they will soon offer a modified XL Boss that allows switching back and forth between operating systems. When this becomes available, I will again make the Fantastic Voyage into the innards of my Atari, performing a second brain transplant.

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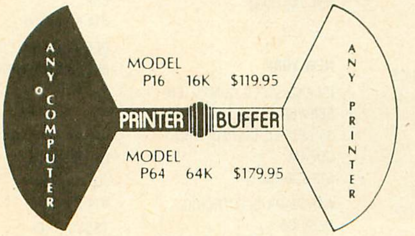
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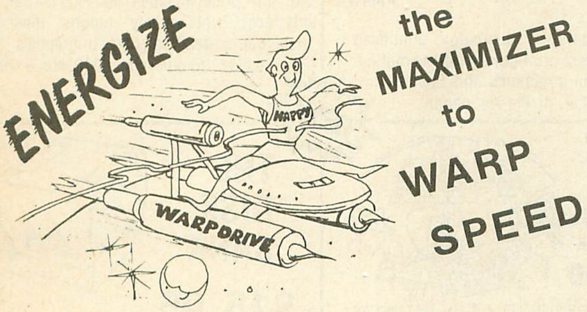
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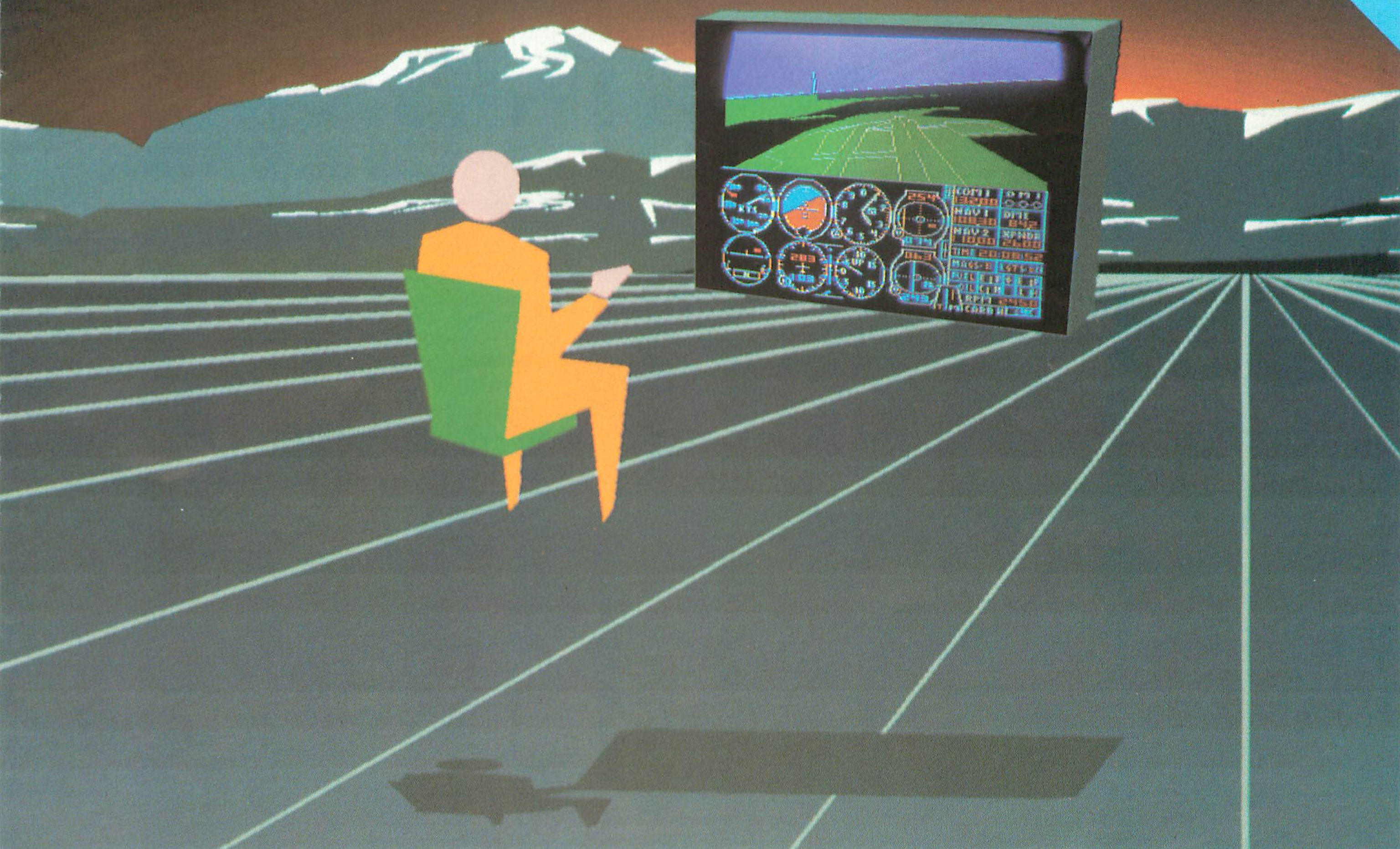
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